DECEMBER 7, 1953

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

Marketing Research

As radar helps airmen, marketing research can help you navigate in all economic weathers. For pointers on how to use the tool, see p. 125

No. 10 of a Management Series

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Nodular Iron *magaloy* Rolls

produce spectacular rolling tonnage

Typical comments illustrate the spectacular results with Nodular Iron Rolls.

"With your Magaloy (Aetna's trade name) strip mill and skelp mill rolls, I have increased rolling tonnage (before redressing) as much as 50% over steel rolls."

Another user reports he has switched to nodular iron rolls because of savings in breakage over alloy iron rolls.

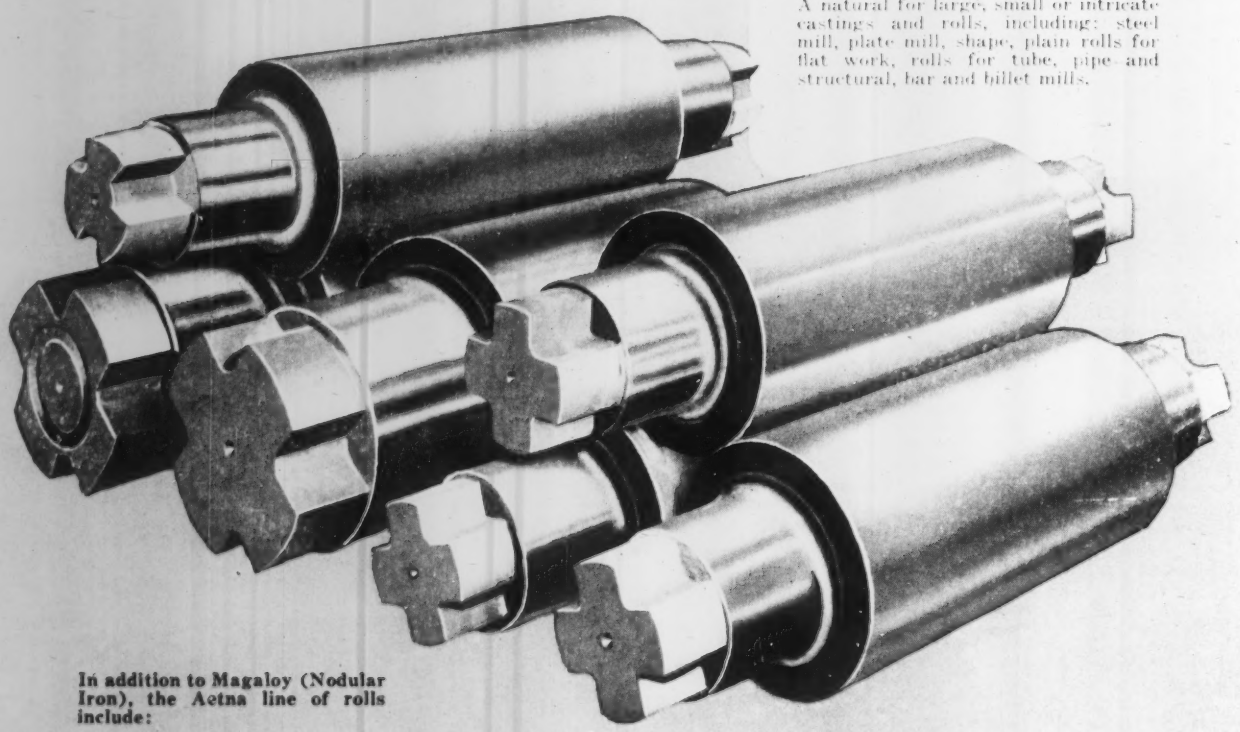
Aetna's roll specialists can give you data on Magaloy Rolls. Their services are available upon request.

UNUSUAL PROPERTIES

Nodular Iron does not roughen up; responds to heat treatment; has better casting properties than steel; physical properties similar to plain carbon steels; lower cost than steel.

APPLICATIONS

A natural for large, small or intricate castings and rolls, including: steel mill, plate mill, shape, plain rolls for flat work, rolls for tube, pipe and structural, bar and billet mills.



In addition to Magaloy (Nodular Iron), the Aetna line of rolls include:

PLAIN CHILL	ASEX GRAIN
MOLY CHILL	PIPE MILL
NICKEL CHILL	RUBBER MILL
ALANITE A-B	PLASTIC MILL

THE AETNA-STANDARD ENGINEERING COMPANY • PITTSBURGH, PA.

Aetna-Standard

PLANTS IN WARREN, OHIO • ELLWOOD CITY, PENNSYLVANIA

SUBSIDIARY and ASSOCIATED COMPANIES

Head Wrightson Machine Company, Ltd., Middlesbrough, England — Great Britain, Finland, Sweden, Norway, Denmark, Union of South Africa, Northern and Southern Rhodesia.

Aetna-Standard Engineering Company, Ltd., Toronto, Ontario, Canada.

M. Castellvi, Inc., New York, N. Y. — Mexico, Central and South America.

Societe de Constructions de Montbard, Paris, France — France, Belgium, Holland, Luxembourg, Switzerland.

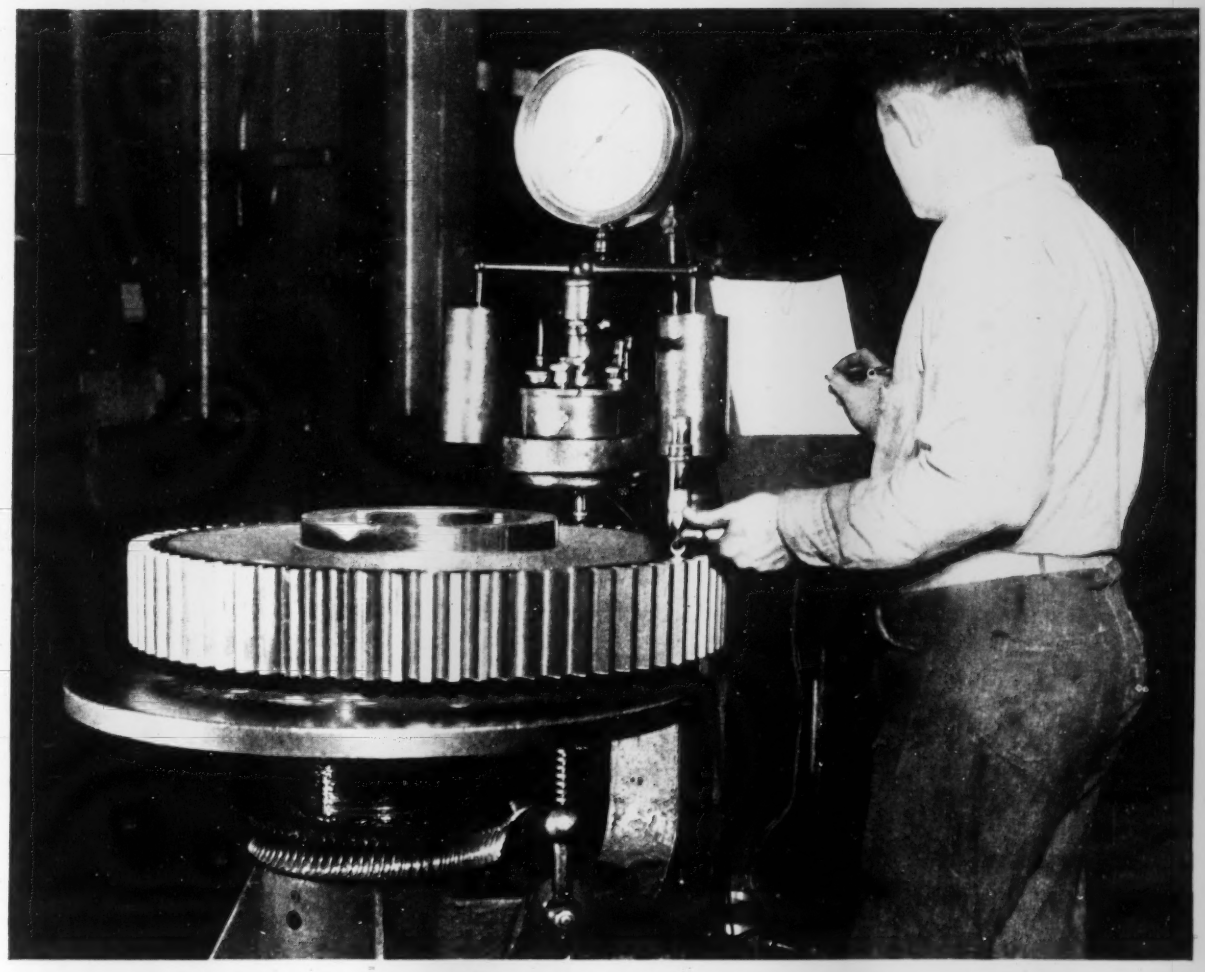
Demag Aktiengesellschaft, Duisburg, Germany — Germany, Austria, Yugoslavia, Greece, Turkey, Egypt.

Compagnia Italiana Forme Acciaio, Milano, Italy — Italy.

Aetna-Japan Company, Ltd., Tokyo, Japan — Japan.

Hale & Kullgren, Inc., Akron, Ohio — Representative for the Rubber Industry.

Designers and Builders to the Ferrous, Non-Ferrous, Leather, Rubber, and Plastic Industries



Checking a locomotive spur gear at one of the great General Electric plants.

Back of Every Good Gear Is a Good, Strong Blank

Big gears for diesel locomotive service have to run a gantlet of inspections and approvals by metallurgists, engineers, and machine-shop technicians. When products of this sort have been passed, no one can ever doubt their fitness.

The basis of a good gear is a good blank. Today, makers of top-quality locomotive gears are protecting their customers and reducing their scrap by using Bethlehem forged-and-rolled blanks for spur gears in traction motor drives. These same manufacturers report that the blanks are economical in first cost, sound metallurgically, and easy to machine.

Have you tried these forged-and-rolled blanks in your own operations? If not, there is no better time than right now. You'll find them ideal not only for gears, but for crane and sheave wheels, flywheels, turbine rotors, industrial wheels, tire molds, and other parts where high strength without excessive weight is required. They are available in a wide range of sizes — 10 to 42 in. OD — and they can be furnished heat-treated or untreated, as you prefer.

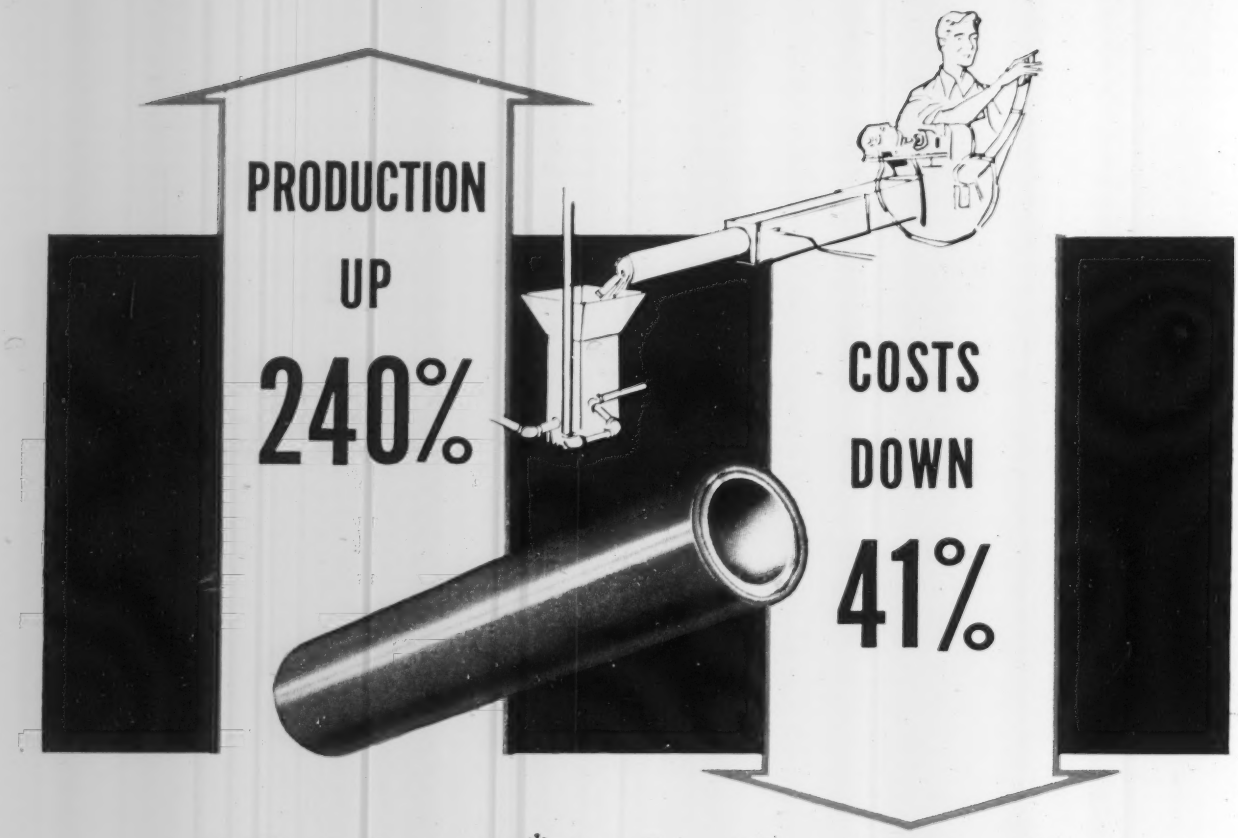
Write for a free copy of Booklet 216. Lavishly illustrated, it will suggest many ways in which these sturdy, reliable blanks can ease design and production problems.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM FORGED-and-ROLLED CIRCULAR BLANKS



with TOCCO* Induction Heating

Whether you're interested in upping production or downing costs—or both—it pays to investigate TOCCO Induction Heating if you heat-treat, anneal, braze, solder, forge or melt ferrous or non-ferrous metal parts.

PRODUCTION UP—When Thompson Products Ltd., St. Catharines, Ontario switched from conventional methods to TOCCO Induction Hardening of their automotive wrist pins, production rose from 500 to 1200 per hour.

COSTS DOWN—While production jumped, costs fell from $5.46 per hundred parts to $3.23—a savings of more than 2c per pin or $26.76 per hour on the hardening operation alone.

OTHER ADVANTAGES—Additional savings result from elimination of hauling wrist pins to and from the heat-treat department. Cool, clean TOCCO fits right in the production line, next to related operations—takes only ¼ the space of the pusher-type furnace previously used.

In Canada or the United States TOCCO engineers are glad to survey your operations for similar cost-cutting results—no obligation, of course.

THE OHIO CRANKSHAFT COMPANY

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-12, Cleveland 1, Ohio

Please send copy of "Typical Results of TOCCO Induction Hardening and Heat Treating".

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

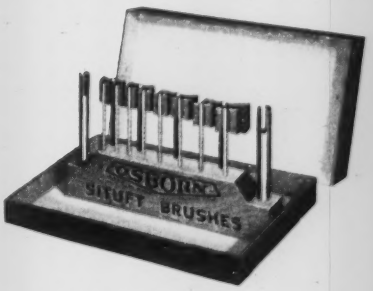
This brush cleans up when the chips are down

Deep down in the threads of these stainless steel coupling nuts are tiny abrasive chips and burrs which can ruin a good fit and costly thread gages.

The problem here was to clean out those chips and burrs *completely*. Hand methods were slow and far from thorough. The inspection bench kept sending too many back for re-working . . . time-consuming, costly.

Then Osborn Situft Brushes were tried and the threads were deburred and "de-chipped" quickly and cleanly every time. Mounted in its holder, the Situft Brush is chucked in the tapping head. Then the brush *threads* its way in at 100 fpm, reverses and threads its way out at 200 fpm . . . the bristles getting down to the roots of the threads and removing all abrasive chips and burrs without a miss.

If you have any kind of a deburring, cleaning or finishing problem, a special Osborn-equipped machine or Osborn brushing machine may be the answer you're looking for. We'd be glad to send you the new free Bulletins on Situft Brushes and Automatic Deburring. Or, if you prefer, why not take advantage of the wide experience of your **O**sborn **B**rushing **A**nalyst to help on your problem. Call him today, or write *The Osborn Manufacturing Company, Dept. G-13, 5401 Hamilton Avenue, Cleveland 14, Ohio.*



Kit of Situft Brushes and holders is available. Variety of brush sizes to suit various applications. Write for bulletin on Osborn Situft Brushes.

Osborn Brushes

OSBORN BRUSHING METHODS • POWER, MAINTENANCE AND PAINT BRUSHES • BRUSHING MACHINES • FOUNDRY MOLDING MACHINES

Tenn-sil in the sand means quality in the castings

Tenn-Sil, additive to foundry sand, improves the quality of the end product and reduces the danger of casting defects.

Tenn-Sil No. 1 . . . *Reduces expansion and, by increasing hot deformation, acts as a cushioning agent in the elimination of rat tails, buckles and certain types of scabs. It is also useful for insulating hot metal when delays in pouring occur.*

Write for test report T- 3028 for further details.

Tenn-Sil No. 2 . . . *Constitutes a specific improvement over Silica Flour for co.e-room operations and steel facing sands inasmuch as it is a neutralized high Silica compound containing no free Silica and therefore offers no silicosis hazard to the operators.*

For properties of facing sands containing Tenn-Sil No. 2 write for test report T-3070.

TENNESSEE
PRODUCTS & CHEMICAL
Corporation
NASHVILLE TENNESSEE

This Week in Metalworking

STEEL

Vol. 133 No. 23 December 7, 1953

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INSIDE REASONS

1 Helical, wear-hardened gears cut from alloy steel forgings and shaved before hardening for correct eccentricity and helical angle and bright, smooth surfaces—factors contributing to quiet operation and longer life.

2 Gear arrangement in simple train minimizes number of moving parts—promotes quietness.

3 Pinion and gear supported and spaced to reduce deflection—permits high load-carrying capacity.

4 Splash system with large oil reservoir assures constant and thorough lubrication of all parts.

5 Anti-friction bearing construction throughout.

6 Reliance *Precision-Built* Motors provide the maximum in dependable and economical power.

RELIANCE Precision-Built MOTORS

Write for
GearMotoR Bulletin E-2404

Sales Representatives in Principal Cities

RELIANCE
ELECTRIC AND
ENGINEERING CO.
1081 Ivanhoe Road • Cleveland 10, Ohio

"All Motors are NOT Alike"

STOP RUST

once and for all

with HOT-DIP GALVANIZING

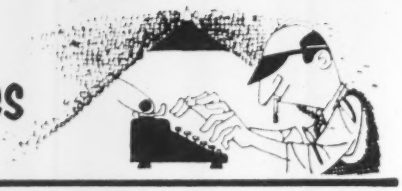
Send your iron and steel products to a member of the American Hot-Dip Galvanizers Association. His years of experience plus collective know-how assure you of a top quality job—if it's iron or steel have it Hot-Dip Galvanized.

HOT-DIP GALVANIZING

Send for Free Booklet

American Hot Dip Galvanizers Association
1607 1st National Bank Bldg., Pgh. 22, Pa.
Print
Name
Firm
Address
City State

behind the scenes



Anyone for Cybernetics?

Just the other night while Sam Spade was tracking down a merciless killer for the benefit of the Mrs., we curled up in our favorite chair and tussled with the fascinating subject of "Cybernetics".

The word "cybernetics" comes from the Greek word meaning "steersman." It describes the principle of feed-back which, apparently, was first employed in steering a ship and which now is giving birth to a Buck Rogers dream-world of the future.

We were entranced as our author spoke of developments that someday would make possible machines that reproduce themselves . . . telephone systems with vocal dialing . . . electronically monitored highways . . . no-hands subways . . . fully automated factories . . . automatic warehousing . . . etc.

Perhaps "cybernetics," or "automation" as it is more popularly called, is leading us fast into a *second* Industrial Revolution . . . an industrial revolution which will substitute the machine for some of the current functions of the human mind.

In metalworking, we already have examples of automation in action, such as Ford's engine plant in Cleveland, its engine lines in Dearborn, Mich., and press lines in its new pressed-steel plant at Buffalo. In Rockford, Ill., the Rockford Ordnance Plant is, we are told, "living proof of the awesome potentials of automation."

Engineering skills and know-how bring *everything* within the scope of automation.

Here's a subject which fires the imagination. May we humbly suggest that you stay close to your weekly issues of STEEL for news of developments in cybernetics and automation. There could be some interesting applications for your production problems.

The Deluxe Treatment

!!!!! These are exclamation marks, or, if we may be permitted a Shrdlu-ism, periods that have blown their tops. They have much in common with STEEL editors during the current *Pre-Metalworking Yearbook* daze.

Imagine, if you will, this bit of organized frenzy taking place right now on floor No. 9 of the old paper mill. It's the most complicated logistical problem since D-Day.

STEEL's technical editors are in the midst of collecting and assimilating data submitted by 240 experts in all phases of metalworking. The sum total of their job will end up as the most complete and comprehensive—yes, and authoritative—"Forum on Technical Progress" ever presented in a STEEL *Yearbook* issue.

Fifteen subjects will be covered in this section: steelmaking, nonferrous metals, casting, materials and metallurgy, heat treatment, inspection and testing, drives and controls, machining, tooling and gaging, forming, cleaning and finishing, assembly methods, materials handling and packaging, lubrication and plant service and maintenance.

Every reader of STEEL will find something interesting and useful in the "Forum". Suggest you stay tuned in on BTS and learn about the many other special features being built into your Jan. 1, 1951, *Metalworking Yearbook*.

Thank You, Mr. Redding!

Here is the kind of story which makes our typewriters chatter with joy. It concerns the article "Rolls Straighten Out Shaft Shortage" which appeared on page 97 of STEEL's Oct. 19 issue.

W. L. Redding of Ketchum, MacLeod & Grove, advertising representatives for Mackintosh-Hemphill, reports that "the Burroughs story on the use of a Mackintosh rotary straightener drew to date 12 letters that specifically mention STEEL (as the source of information). Naturally, the client is much impressed with the pulling power (reader reaction) of this story."

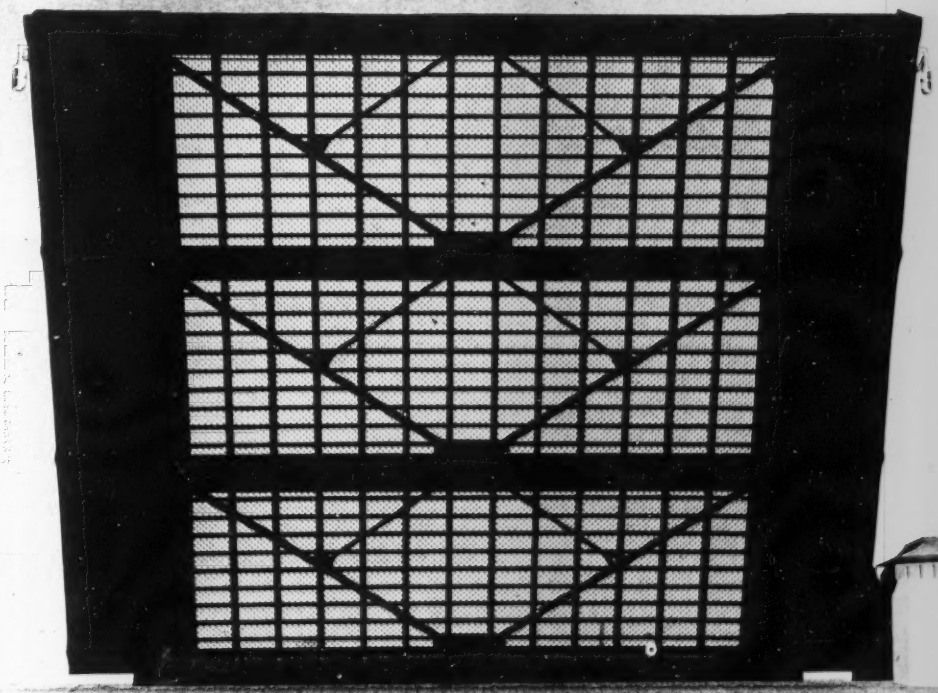
The thing that pleases us about Mr. Redding's letter is not so much that Mackintosh-Hemphill is impressed with the fact that STEEL's story was well written, or that it attracted inquiries, perhaps potential customers. We like the fact that our readers found the article useful . . . helpful.

That's why we're in business and letters like the above tell us we're doing our job.

Shrdlu

(Metalworking Outlook Page 77)

Here is one for the Road



Welding bridge floor sections together.

Sharon representatives work in close contact with manufacturers to help develop better products at lower costs.

Assembling sections.

Shaping special pattern.

DISTRICT SALES OFFICES

Chicago	Cincinnati
Cleveland	Dayton
Detroit	Indianapolis
Milwaukee	New York
Philadelphia	Rochester
Los Angeles	San Francisco
Montreal, Que.	Toronto, Ont.

SHARONSTEEL

OPEN grating bridges are being used in increasing numbers on the nation's roadways. They are strong, quick to assemble, comparatively low in cost.

A large number of these structures, in fact, a great percentage of grating used for all purposes, is made of Sharon Quality Hot Rolled Strip.

Sharon rolls this grating steel to width. There's no slitting. This gives the smooth mill edge that eliminates costly edging operations. This advantage, plus the consistent quality and dependable service, is the reason why today more grating is being made of Sharon steel than ever before. If your product calls for narrow strip and a smooth edge is desirable you'll be wise to talk with your nearest Sharon representative.

SHARON STEEL CORPORATION

Sharon, Pennsylvania

PRE-TESTED MACHINABILITY GETS AUTOMATICS INTO PRODUCTION ...FASTER

● That's why we make this test part in our own plant at Massillon, Ohio. It embodies the six most common automatic operations. By studying it, we discover how to make Union Drawn Steels even better for automatics. More free-machining. More profitable for you. When the part has served its purpose for research, we scrap it.

When you know how a steel will behave *before* you put it on your automatics, you save a lot of headaches. You get set up sooner, using the best combinations of feeds and speeds. There are more parts in the pan, fewer in the reject box. Production is maintained. So are profits. Sometimes they're increased.

And just to make sure you get the most out of the Union Drawn Steels you buy, one of our metallurgists or machining engineers will be glad to talk to your set-up man. Swapping hints on tool angles, heavier feeds and speeds, they can often come up with the best ways to run Union Cold Drawn Steels. When shall we call?

6 HELPFUL MANUALS

filled with how-to-do-it information and data to help you use Union Cold Drawn Steels. Write for "Union Drawn Pocket Library."

●

Free Machining Bessemer, Alloy and Enduro Stainless Steels

Union Cold Drawn Special Sections

Union Cold Drawn and Ground Rounds, Turned and Polished Rounds, and Turned, Ground and Polished Rounds (Union Precision Shafting)

REPUBLIC STEEL CORPORATION
Union Drawn Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

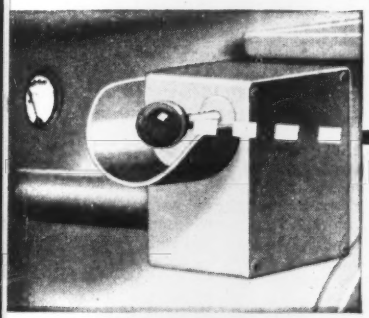
Republic UNION COLD DRAWN STEELS

REPUBLIC STEEL

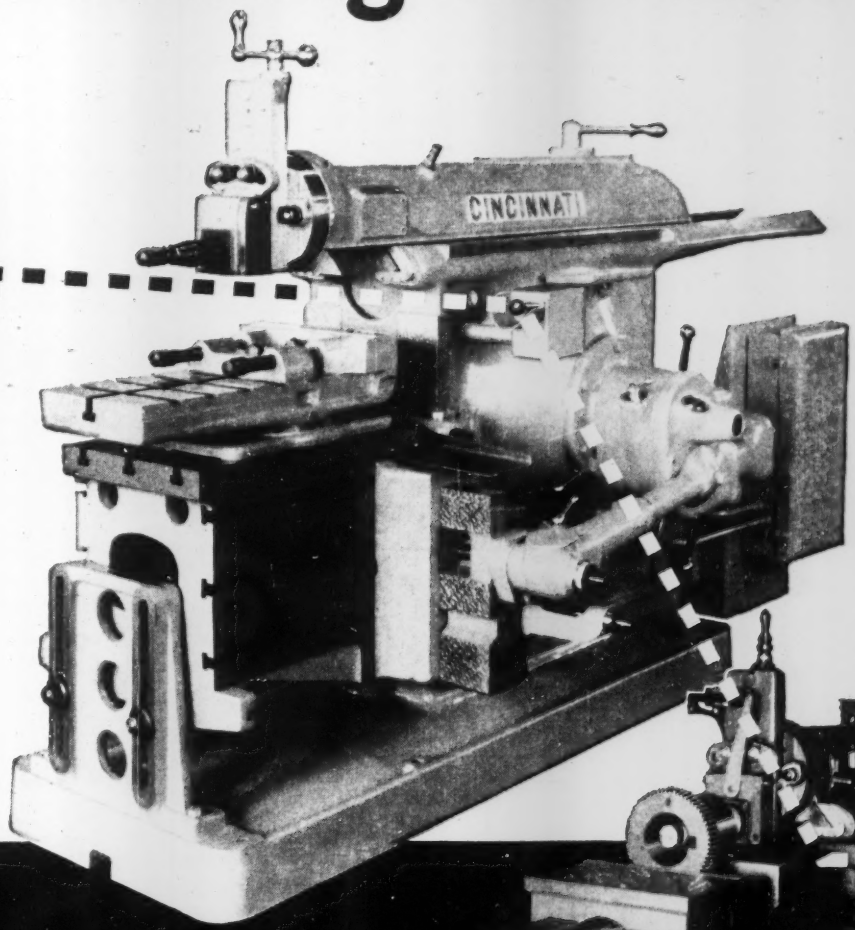
US

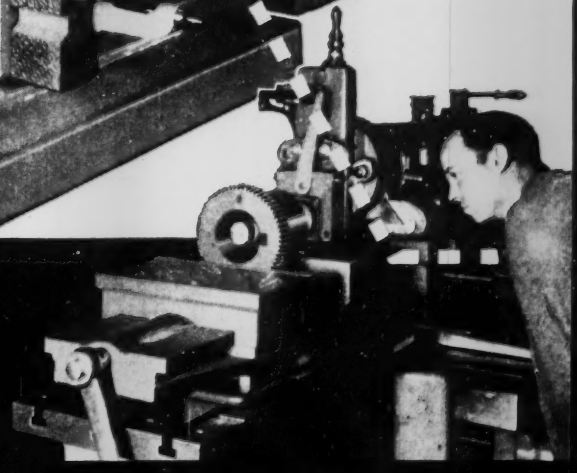
STEEL

Outstanding Time Saver...
...Outstanding ACCURACY



Single Control Lever





30% Time Saving

Shaping time on 7 internal oil grooves in these steel sleeves was reduced from 12.5 minutes to 8 minutes, by the Cincinnati Electro-Magnetic Clutch and Brake.

The New Cincinnati Magnetic Clutch and Brake, with its single, convenient control lever, gives the operator the fastest, simplest and most accurate control of his Shaper and converts waste time into productive time.

This powerful clutch and brake requires no adjustment, and has a long, maintenance-free life.

Write for Cincinnati Shaper Catalog N-5.

CINCINNATI

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO, U.S.A. SHAPERS • SHEARS • BRAKES

KEYSTONE

"Special Processed"

COLD HEADING WIRE

EXCELLENT FLOW PROPERTIES

PROLONGS DIE LIFE

FEWER REJECTIONS

REDUCES INSPECTIONS

You gain increased efficiency from your cold heading machines when you specify KEYSTONE "Special Processed" Cold Heading Wire. The excellent flow properties of this "Special Processed" wire assures uniform, strength-giving grain structure which "trademarks" high quality production.

Rigid quality controls and careful selection of raw materials — plus our own exclusive drawing and heat treating process gives KEYSTONE "Special Processed" Cold Heading Wire unsurpassed structural soundness and uniformity for all your difficult cold heading operations. For further information, write Keystone Steel & Wire Company, Peoria 7, Illinois.

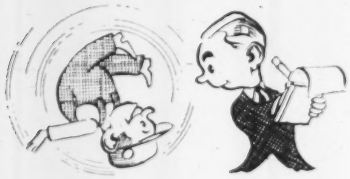
INDUSTRIAL WIRE SPECIALISTS

Keystone Steel & Wire Company

PEORIA 7, ILLINOIS

LETTERS TO THE EDITORS

What's in a Percentage?



I read the very interesting article regarding the Burroughs Corp., "Burroughs' Personnel Ideas Add Up to Efficiency" (Oct. 26, p. 82). In it you state the labor turnover rate in industry generally is 4.10 per cent while the Detroit area level is 6.13 per cent. I am writing to ask if you could supply us with the formula followed in determining these percentages. We calculate the labor turnover in our plant but are never sure that the formula we follow in determining our percentage of turnover is the one generally used. We would like this formula so that we may know that any comparisons we make are on a proper basis.

W. F. Brown
superintendent of industrial relations
Youngstown District
U. S. Steel Corp.
Youngstown

• *The formula used in computing the figures to which you refer is the standard Bureau of Labor Statistics formula. Suggest you contact that organization for complete information.—ED.*

Quizzer on Spot Testing

This installation's metallurgical laboratory is establishing spot test procedures for the identification of various metals and alloys.

In this connection, we would like to get a tear sheet of the article "Spot Testing Aluminum Alloys" (Jan. 28, 1952, p. 67) by F. S. Bowen, Division of Metallurgy Research, Kaiser Aluminum & Chemical Corp., Oakland, Calif.

W. B. Pohlman
Lt. Col., Ordnance
White Sands Proving Ground
Las Cruces, N. Mex.

• *They're being sent.—ED.*

Call for Depreciation Reform

I would appreciate your sending me several copies of the article "Depreciation Reform" (Nov. 2, p. 79) No. 9 in STEEL's Program for Management. It's a good article.

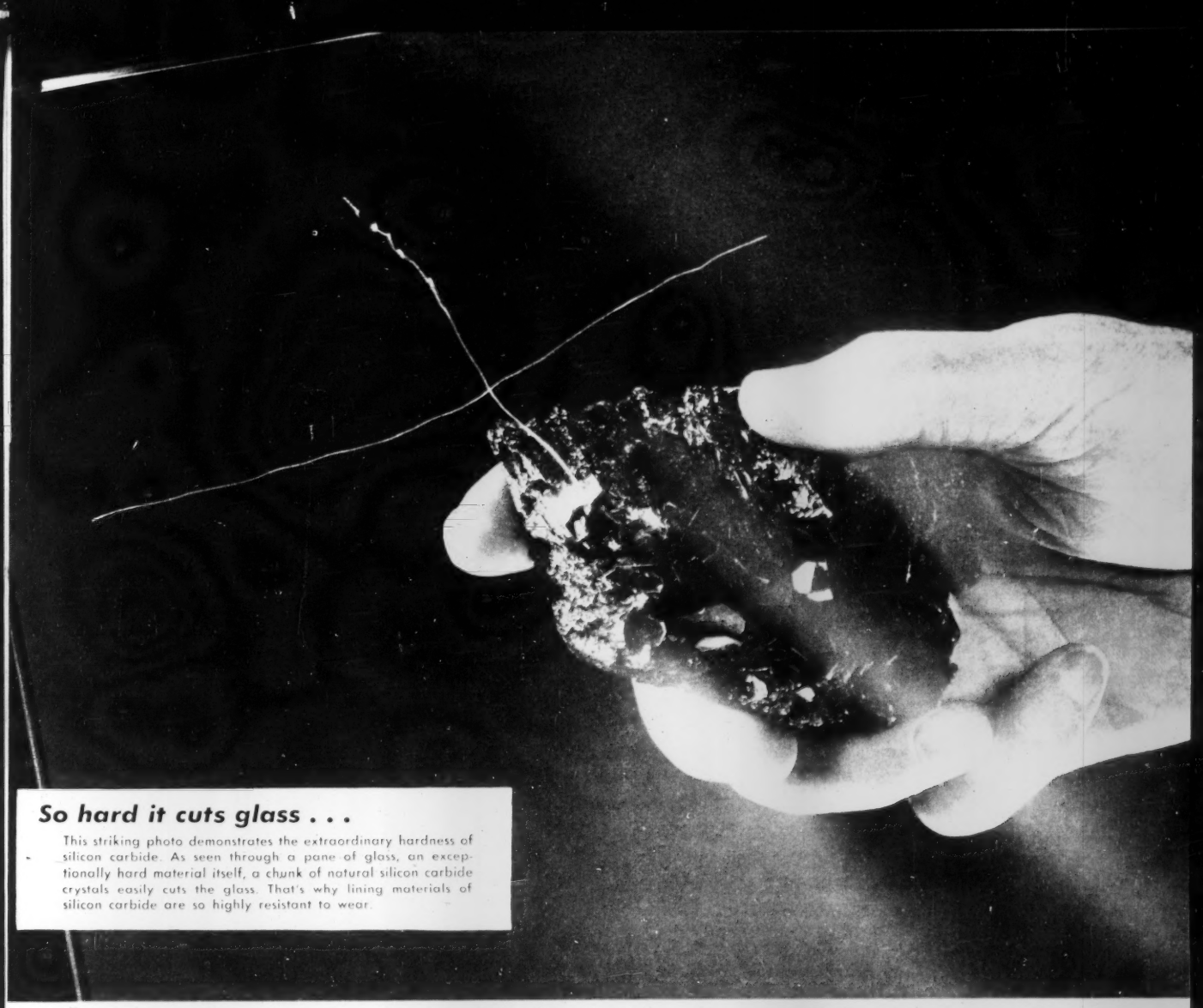
Earl A. Graham
Bureau of Industrial Economics
Federal Trade Commission
Washington

• *Sent.—ED.*

Tool Steel Guide Available

Our engineering department is in need of information regarding the different types and characteristics of tool steel. We understand that you published a special report entitled "Guide for Selecting Tool Steels and Carbides" (June 16, 1952, opp. p. 106). If you

Please turn to p. 12



So hard it cuts glass . . .

This striking photo demonstrates the extraordinary hardness of silicon carbide. As seen through a pane of glass, an exceptionally hard material itself, a chunk of natural silicon carbide crystals easily cuts the glass. That's why lining materials of silicon carbide are so highly resistant to wear.

Close to the diamond in hardness, silicon carbide is the . . .

Most Versatile, Wear-Resisting Material

Unique among man-made materials, silicon carbide offers exciting possibilities in applications where severe wear is a problem. Resistance to impinging solids, to corrosion, and to heat shock are some of its features . . . along with high load-carrying capacity.

Even under the toughest conditions of wear known, our CARBOFRAX® silicon carbide refractories have repeatedly outlasted special alloys and other materials generally considered to be highly durable. *This applies to room-temperature applications as well as to others ranging to above 3000 F.* It applies to wear caused by rubbing or sliding, and to wear caused by impingement of sharp particles traveling at high velocities.

For example: *In coke chutes and hoppers* that must withstand punishing cascades of sharp-edged coke . . . *in hot blast mains, blast furnace downcomers, and cyclone dust collectors* where abrasive dust is entrained in high-velocity gases . . . *in reheating furnaces* where metal slabs are pushed over skid rails or directly across the floor.

CARBOFRAX refractories are made in various thicknesses — are available as special, close-tolerance shapes, and as standard brick. They can also be supplied with interlocking joints. The coupon below will bring complete information. Why not check up? See how this unusual material can give real "armor-plate" protection.

CARBORUNDUM

Registered Trade Mark

Dept. G-123, Refractories Division
The Carborundum Company
Perth Amboy, N. J.

Please send descriptive data to:

Name

Position

Company

Street

City Zone State

WHY do process engineers do it?

AGAIN AND AGAIN we learn where process engineers and gage engineers order gages *specially* designed and built when a Federal Catalog Gage, as is, or with slight modification, will perform as well and usually better. In one instance, the special gage could have been readily obtained by adapting a Federal stock catalog gage (price $147.00) plus a modest charge ($45.00) for modifying it. — What was the cost of the special gage? — $432.00! — That, my friend, is more than twice the cost of the modified Federal gage, *and it is only one of many similar cases.*

Another outstanding example is a customer who ordered from various sources an exceptionally large number of special gages, many of which proved to be unsatisfactory. He could have bought Federal stock gages modified to suit his particular needs, with faster delivery and a saving of thousands of dollars.

We've had a lot of gage experience and we'll be glad to put it to work for you. Before you start specifying special gages, let us know what your process sheets require and we'll see what Federal Gages can be modified to do the job. Federal Products Corporation, 2112 Eddy Street, Providence 1, Rhode Island.

FEDERAL

Largest manufacturer of indicating type gages . . . exclusively

LETTERS

Concluded from p. 10

have a copy available, we would appreciate your sending a copy.

W. R. Tramon
assistant purchasing agent
Huntington Division
Houdaille-Hershey Corp.
Huntington, W. Va.

Kindly send me three copies . . .

R. S. Thompson
cement development engineer
New Products Division
Fifth Sterling Inc.
Pittsburgh

Please send 12 copies . . .

J. Gaunt
Pennsylvania Steel Corp.
Detroit

Please send 3 copies of the "Guide for Selecting Tool Steels and Carbides."

C. S. Becket
Standards Department
Crane Co.
Chicago

• *Sent. We have received so many requests for additional copies of this guide that we have printed a further supply. Reprints of the "Guide for Selecting Tool Steels and Carbides" are available through* STEEL*'s Reader Service Department for $1.00 per copy.—ED.*

Drawing Power Displayed

Unbeknown to us, a photograph of a hydraulic press ram, which we had metal sprayed, was printed on p. 128 of your Oct. 26 issue.

We have received numerous inquiries from throughout the country regarding that job and thought you might like to know of this response to articles and pictures in your magazine.

We would appreciate knowing from whom you received the photograph.

Harvey S. Miller
general manager
New England Hard Facing Co.
Brookline, Mass.

• *We received the photograph from Metallizing Engineering Co. Inc., Long Island City, N. Y.—ED.*

Canadian Queries on Heat Pump

Since we've misplaced our file copy, would you be good enough to forward a copy of the article "Pushbutton Weather from Heat Pumps" (Sept. 21, p. 86).

T. K. Kennedy
Chief Engineer's Office
Canadian Ingersoll-Rand Co. Ltd.
Sherbrooke, Que.

If available, a copy of your article "Pushbutton Weather from Heat Pumps" would be appreciated.

J. L. Spence
general manager
Refractories Engineering and Supplies Ltd.
Hamilton, Ont.

• *Sent.—ED.*

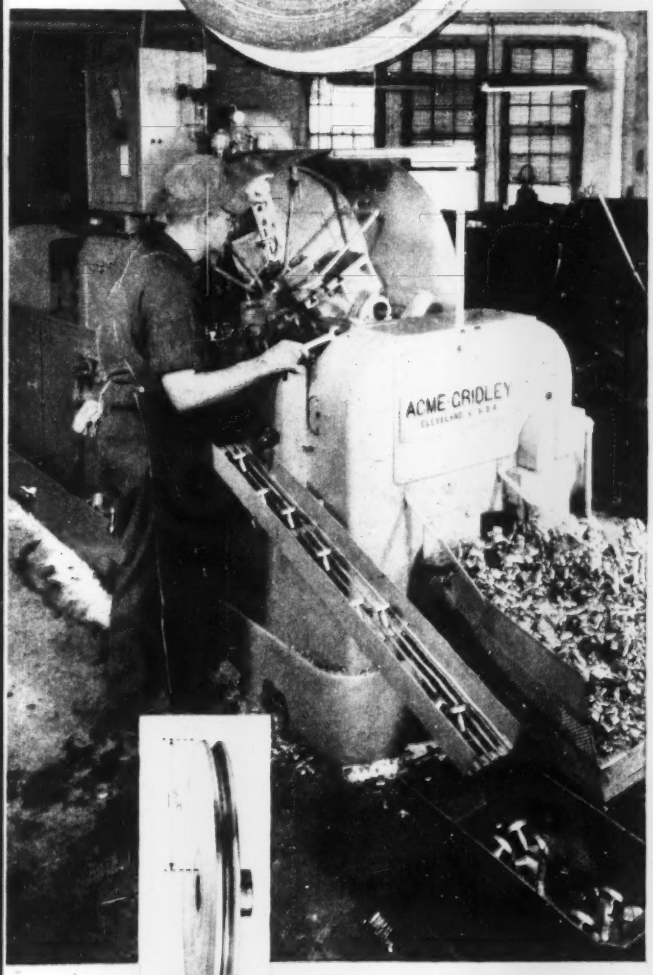
For Carbide with a Twist

We would appreciate it very much if you would send us tear sheets of the article "Carbide with a Twist" (June 29, p. 92).

E. C. Wallace
metallurgist
Barber-Colman Co.
Rockford, Ill.

• *Sent.—ED.*

YOU CAN SAVE—plenty



You'll say it's better machining practice to break up chips and right you are. This one, 58 ft. long, on difficult material, to the full depth of a deep forming cut, was made during the set up. It serves to demonstrate a new kind of machine *stability and performance* which forward looking buyers demand and get in the—

New Model "M"

ACME-GRIDLEY

Single Spindle Bar Automatic

In short, it demonstrates important design and construction features such as frame weight and balance, heavy slides, powerful uniform cam feeds that minimize vibration and increase tool life even at fastest feeds and speeds that modern carbide tools can take—all of which guarantees sustained accuracy, long machine life, lower costs.

Other Acme-Gridley features that promote adaptability and speed on all classes of work—

- ★ *Eight independently operated tool slides*
- ★ *Three automatically selective spindle speed ranges*
- ★ *Independent turret indexing permits overlapping operations*
- ★ *Accessible tools and camming—easy operation, quick change-over on short runs. One man runs 2 or more machines*
- ★ *Time cycle for job is fully automatic—production schedules can be predetermined and met—saving plenty!*

Ask for Bulletin M-50A

JOB FACTS

PIECE: Motor Valve Plate
SIZE: 3⅞" diam.
MATERIAL: E 52100 Ball Bearing Steel
HIGH SPEED TOOLS: 13 are used including trepanning face and drilling hub
MACHINE TIME: 17 min. 50 sec.
MACHINE: 5½" Acme-Gridley Single Spindle Bar Automatic

Remember — **Industry can't do TODAY'S JOB with YESTERDAY'S TOOLS and be in business TOMORROW**

The NATIONAL ACME COMPANY

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Acme-Gridley Bar and Chucking Automatics, 1-4-6 and 8 Spindle —Hydraulic Thread Rolling Machines—Automatic Threading Dies and Taps—Limit, Motor Starter and Control Station Switches—Solenoids—Contract Manufacturing.

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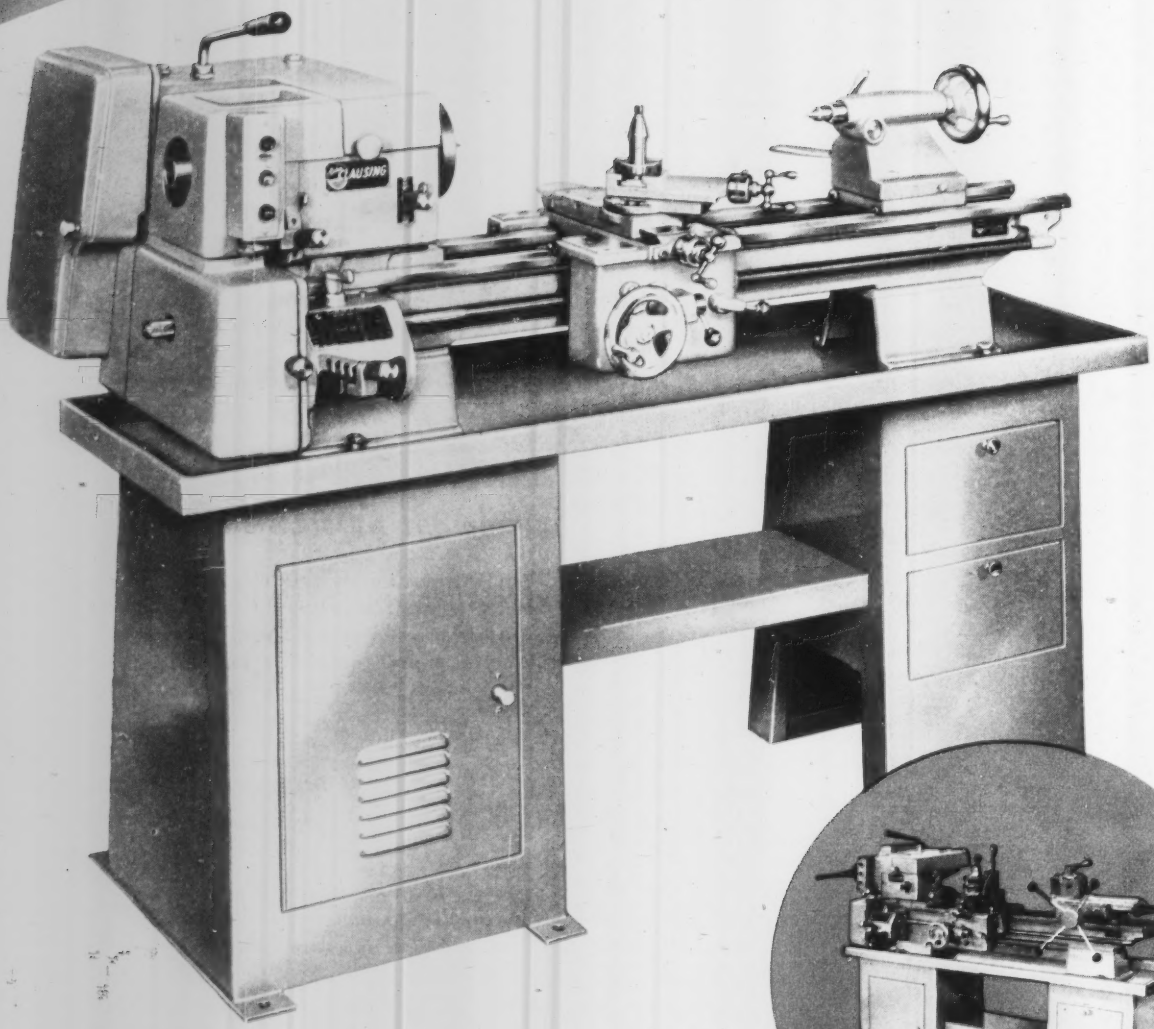

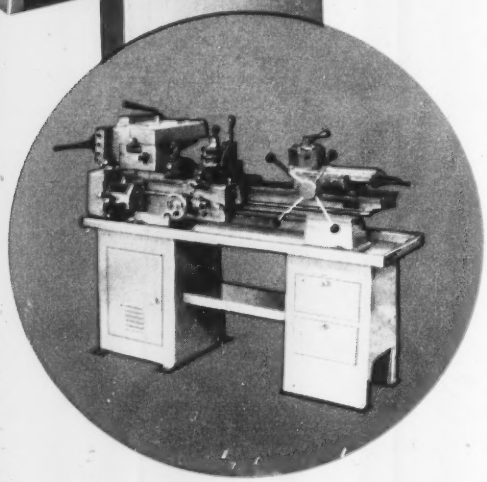

No. 5300 Clausing lathe equipped with lever type collet chuck, lever type carriage turret, bed turret for production hand turret operations.

5300 SERIES CONDENSED SPECIFICATIONS

CAPACITY	Swing: 12¾" over bed; 12½" over saddle wings; 8½" over saddle. 24"-36"-48" between centers.
THREAD RANGE	48 selections. 4 to 224 Standard, right or left.
SPINDLE SPEEDS	Direct: 173, 272, 454, 492, 780, 1300 RPM. Backgeared: 29, 46, 77, 83, 132, 220 RPM.
SPINDLE	Nose, 2¼"-8 threads. Bored for No. 4½ MT, with reducing sleeve to take No. 3 MT. 1⅜" hole thru spindle. 1" collet capacity.
COUNTERSHAFT DRIVE	Built in, with clutch and brake. ⅝" wide B belts. 3-step spindle pulley, 2-step motor pulley.

Atlas CLAUSING
PRECISION MACHINE TOOLS
DIVISION
ATLAS PRESS COMPANY
KALAMAZOO, MICHIGAN U. S. A.

THE NEW VALUE STANDARD IN

PLUS in lathe history!

12" CLAUSING "5300" SERIES (1" COLLET CAPACITY)

"ZERO-PRECISION" TIMKEN TAPERED ROLLER BEARINGS, AND EXCLUSIVE FRICTION CLUTCH AND BRAKE COUNTERSHAFT = GREATER ACCURACY . . . TOP PRODUCTION

For production capacity, accuracy and profit potential, the brilliant new CLAUSING 5300 gives you more *Plus Value* features than have ever before been available in a 1" collet capacity lathe . . . at or near its price!

CAPACITY PLUS! 12" swing + 1⅜" hole through 16" long spindle + 2¼"-8 thread spindle nose + 1" collet capacity + heavy duty No. 3 MT tailstock with tang socket + ⅞" diameter lead screw + 12 speeds, 29 to 1300 RPM + 9" cross slide travel + 2¾" tool post slide travel + up to 48" between centers = Bigger Tool and Job Capacity . . . Wider Work Range!

ACCURACY PLUS! New heavy-duty headstock and tailstock . . . massive bed and carriage . . . for maximum rigidity and stamina + headstock diamond bored for husky Timken "Zero-Precision" tapered roller bearings, the most accurate used in any lathe + forged steel, precision ground spindle with hardened nose + headstock, carriage and tailstock hand fitted to precision ground Vee and flat ways of bed = Greater precision . . . Closer tolerances!

ECONOMY PLUS! Built-in countershaft with friction clutch and brake permits instant starts and stops of spindle without stopping motor + oil flinger spindle bearing lubrication + long wearing steel cable B-section V-belt drive + automatic apron with splash lubrication + instant selection of 48 threads or feeds = Savings in Time . . . Increased Production . . . Longer Life!

New Pedestal Base and Pedestal Cabinets! New pedestal bases and pedestal cabinets are 3 16" steel plate, welded and braced with thick box-type channeling . . . rigid foundations for accurate lathe work. Cabinet, illustrated at left, has drawers in tailstock pedestal . . . base has plain tailstock pedestal. Both have shelf between. Be sure to see the new Clausing 5300 at your Atlas-Clausing dealer's. Feature by feature comparison will prove it's the Biggest PLUS Value in Lathe History!

BENCH LATHE, 24" CENTERS $715.00	PEDESTAL BASE $160.00	PEDESTAL CABINET $200.00
BENCH LATHE, 36" CENTERS 745.00	PEDESTAL BASE 165.00	PEDESTAL CABINET 220.00
BENCH LATHE, 48" CENTERS 830.00	PEDESTAL BASE 175.00	PEDESTAL CABINET 240.00

Prices are less motor and are F.O.B. factory, Ottumwa, Iowa. Prices subject to change without notice.

CLAUSING DIVISION *Atlas Press Company*
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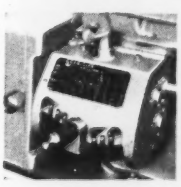
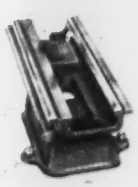
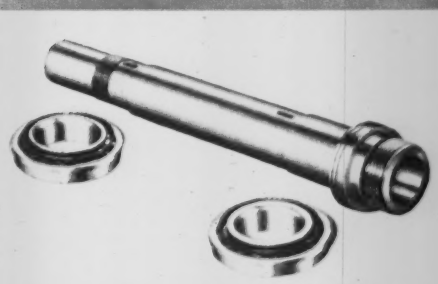


QUICK CHANGE MECHANISM Provides instant selection of 48 threads or feeds. ½" wide steel gears. Ground shafts turn on ball bearings. Plunger-type selector control.

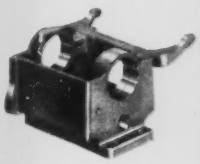


PRECISION GROUND BED Massive, semi-steel bed is 7⅛" wide, 5⅛" deep — thickly ribbed and braced. Vee-ways, flat ways and undersides are ground. Built-in screw-type leveling jacks.

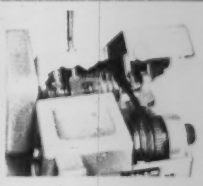
1" COLLET CAPACITY LATHES



BIG PRECISION SPINDLE WITH "ZERO-PRECISION" BEARINGS. Precision ground, forged steel spindle turns on widely spaced heavy-duty Timken "Zero-Precision" tapered roller bearings — bearing run-out tolerance is .00015.

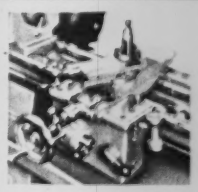


MASSIVE HEADSTOCK Massive headstock casting weighs 45 lbs. Heavy duty construction, plus malleable iron countershaft bracket anchored and doweled to casting to bridge drive opening, assure accurate alignment and rigidity for "the heart of the lathe."



CLUTCH AND BRAKE EQUIPPED COUNTERSHAFT Friction clutch-brake that permits instant starts and stops of spindle without stopping motor. Belts are fully guarded.

LARGE TAILSTOCK Heavy-duty tailstock has No. 3 MT ram with tang socket. Swing-type wrench, permanently attached, controls bed lock.



DOUBLE-WALLED AUTOMATIC APRON ½" wide gears and precision ground steel shafts run in bath of oil — power feeds engaged by positive clutch. New, large, easy-to-read feed dials.

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☐ Please have Factory Representative call.

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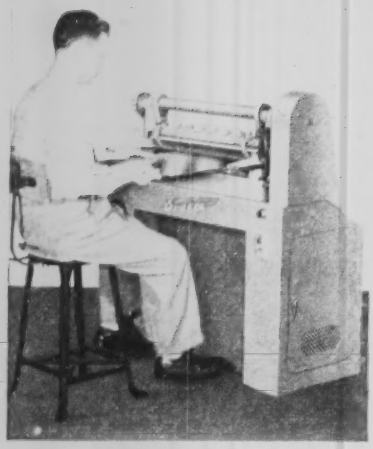

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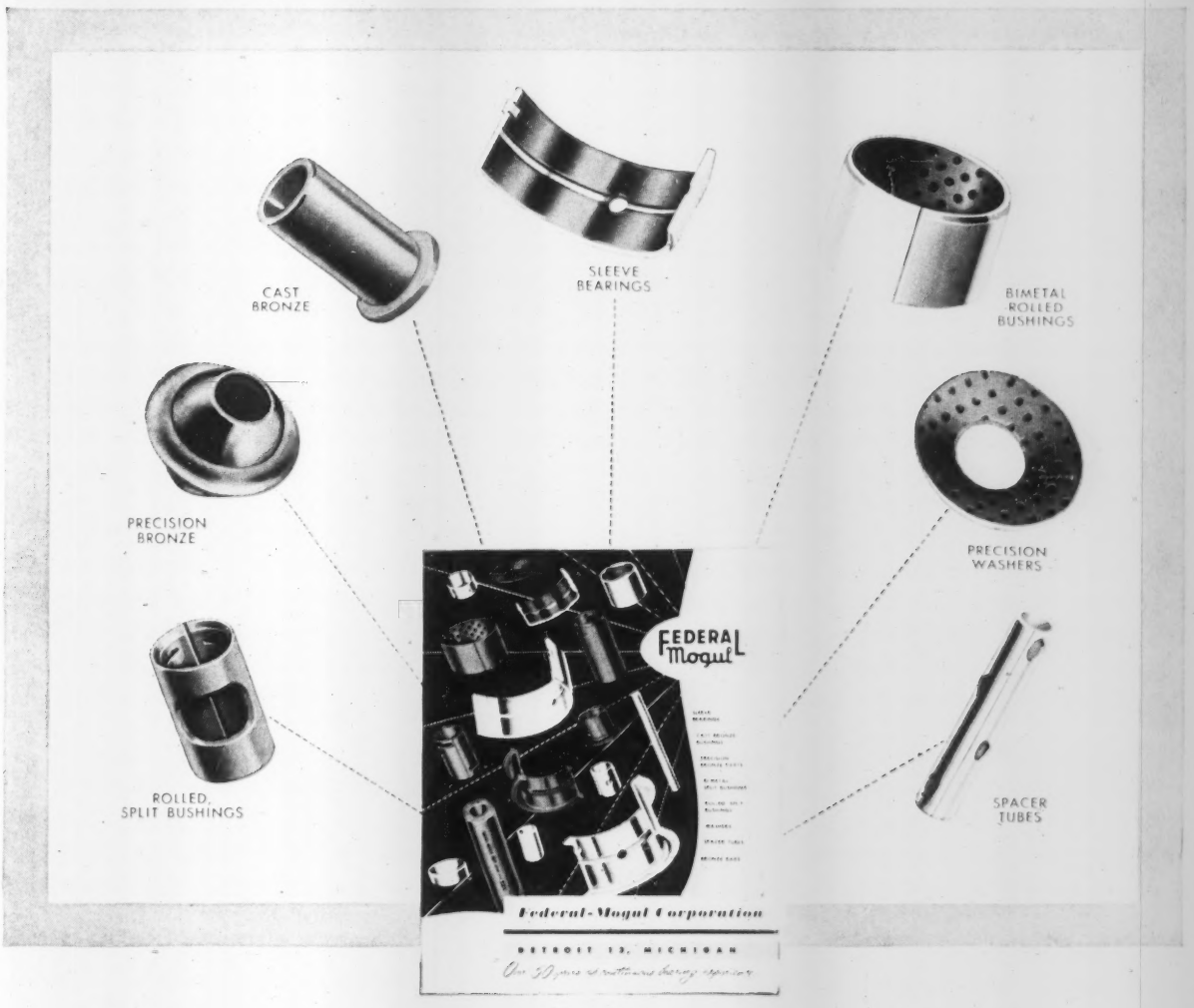

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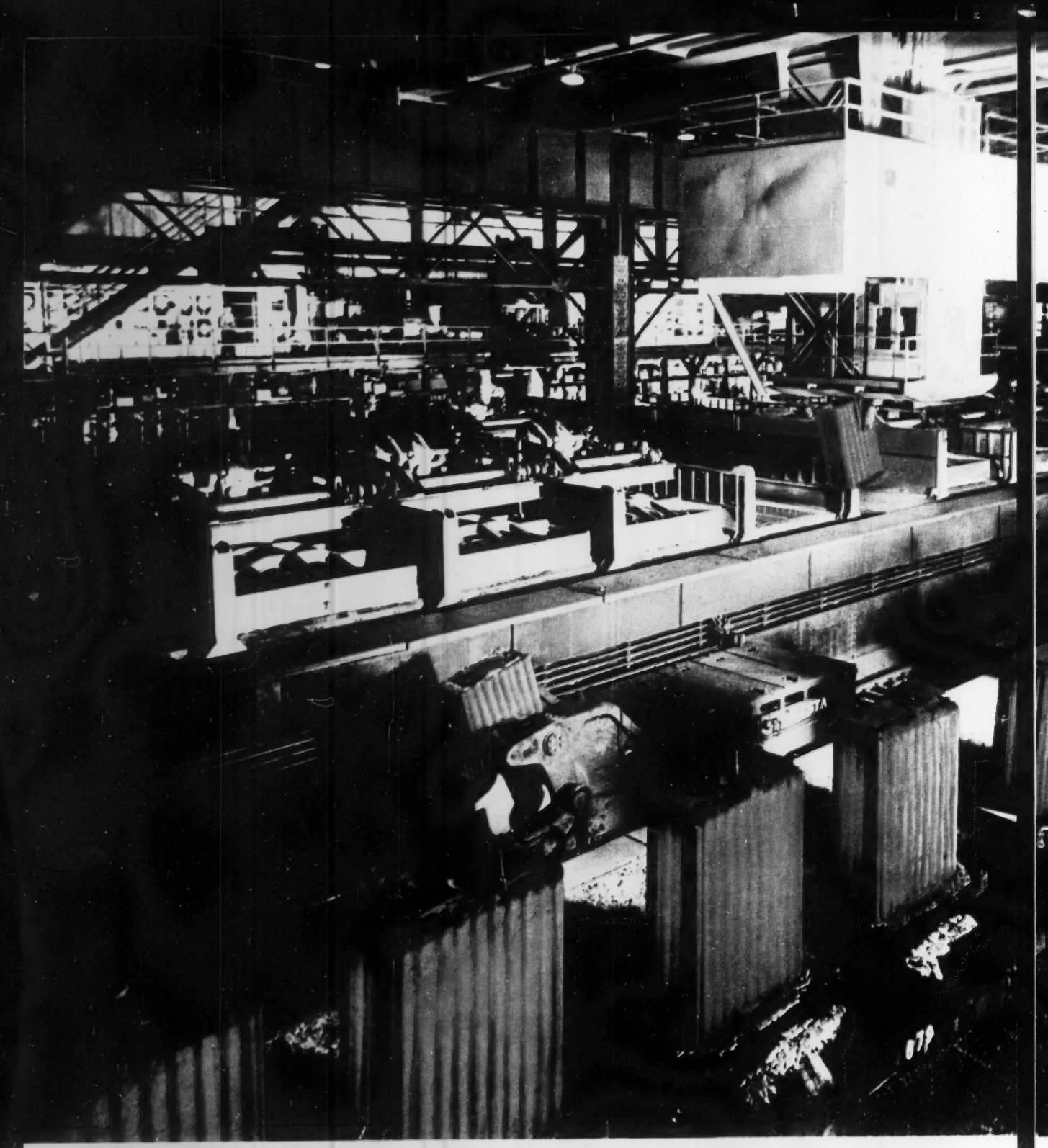

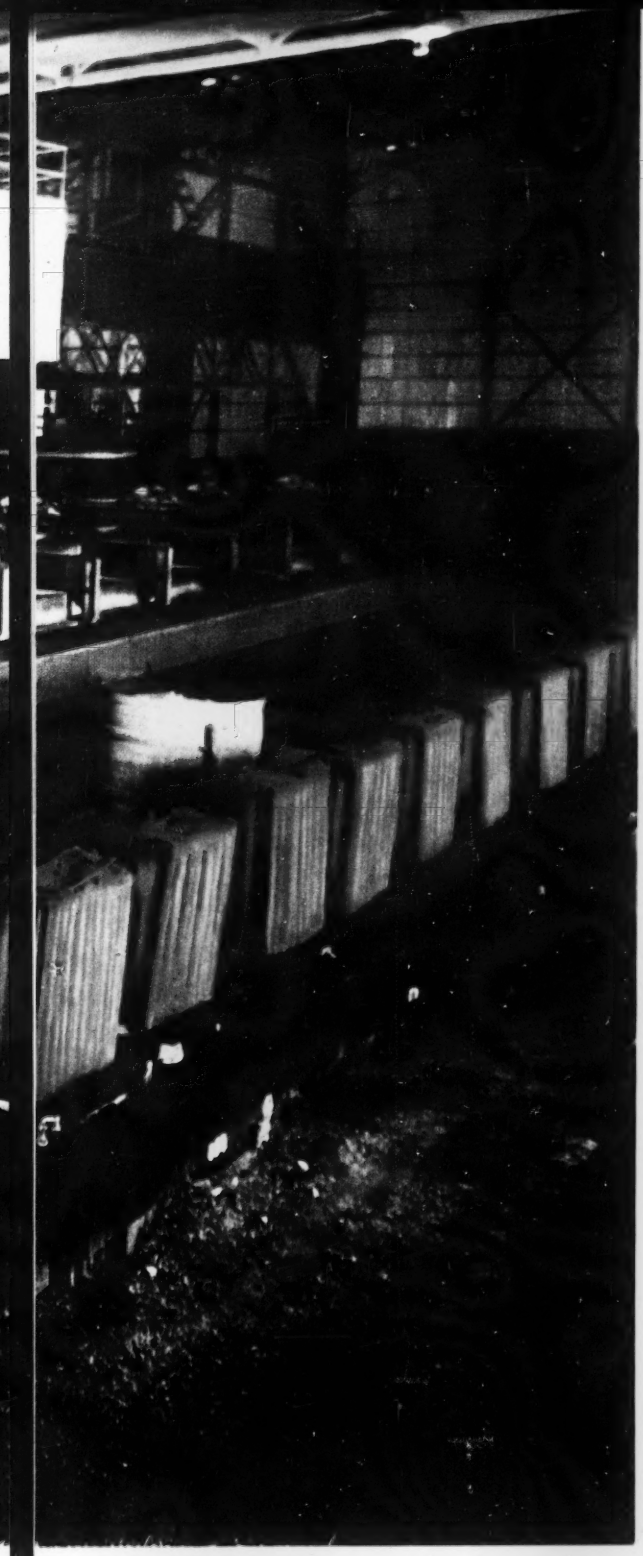

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or oftener" is a comment made by many users of slit-to-width coiled strip. The direct saving ranges from $10.00 to $50.00 or more per ton, depending on width and gauge of strands slit.

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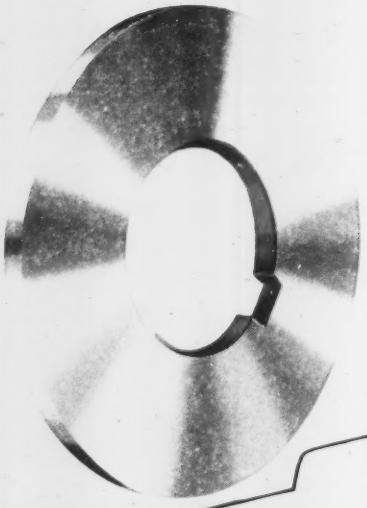


Market Survey reveals Ohio Knife Co. first choice

A national industrial steel publication mailed a preference questionnaire to 1800 metal working plants and steel warehouses. Returns computed showed The Ohio Knife Co. first choice in preference ratings of Slitter Knives and Shear Blades.

COMPANY	METAL WORKING PLANTS	STEEL WAREHOUSES
OHIO KNIFE CO.	14.7%	27.6%
Company "B"	12.8%	13.8%
Company "C"	10.1%	10.3%
Company "D"	10.1%	10.3%

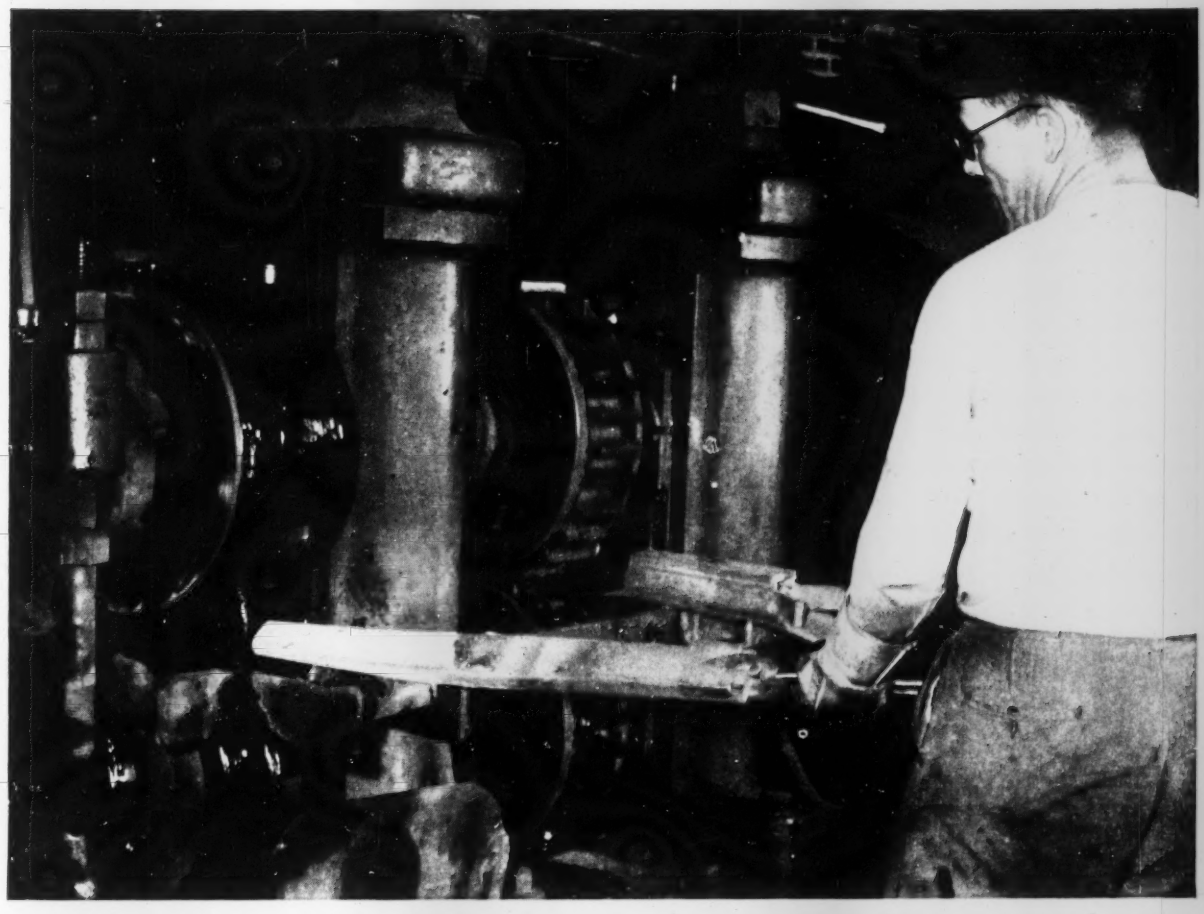
Here's Why Ohio Knife Co. slitting and shearing knives earned this reputation primarily by reducing "downtime". Production savings are realized because Ohio Knives give longer runs, require less regrinding and deliver precision work even on the toughest jobs. OK Slitters are made from the finest tool steel, precision ground to ± .0002 tolerances on thickness, diameter and bore. OK Shear Blades are specially heat treated to bring out best characteristics for different jobs, to give maximum toughness and keen edge-holding qualities. Our engineering department is at your service for recommendations on your slitting and shearing problems. Write Dept. C.

Manufacturers of OK WELDED HIGH SPEED SHEAR BLADES • OK SOLID STEEL SHEAR BLADES • OK SLITTER KNIVES • ROTARY SHEARS, CUTTERS, CHIPPERS, TRIMMERS

GO WITH OHIO GREEN

THE OHIO KNIFE CO.

CINCINNATI 23, OHIO



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Write Today
ADDRESS DEPT. S-48

The John Deere Plow Works of Deere & Company formerly used cast grey-iron dies to swage AISI 1070 F steel plow beams. Die life was, at best, a mere six weeks or about 8,000 parts.

They switched to A-L CAST-TO-SHAPE swaging dies of FCC No. 66 tool steel, hardened and drawn to 57-58 Rockwell "C". The new dies ran *fourteen months*—eight hours a day, five days a week—before redressing was necessary. Approximately *83,875 Parts* (over ten times the production) were swaged in that period! Production has been maintained at that level since.

You, too, can save time and money with the modern FCC CAST-TO-SHAPE method of tool and die making. Don't forget, you also buy *less* steel and reduce machining costs. It's a matter worth investigating. ● Check with your A-L representative TODAY . . . or write *Allegheny Ludlum Steel Corporation, Oliver Building Pittsburgh 22, Pennsylvania.*

For complete MODERN Tooling, call

Allegheny Ludlum

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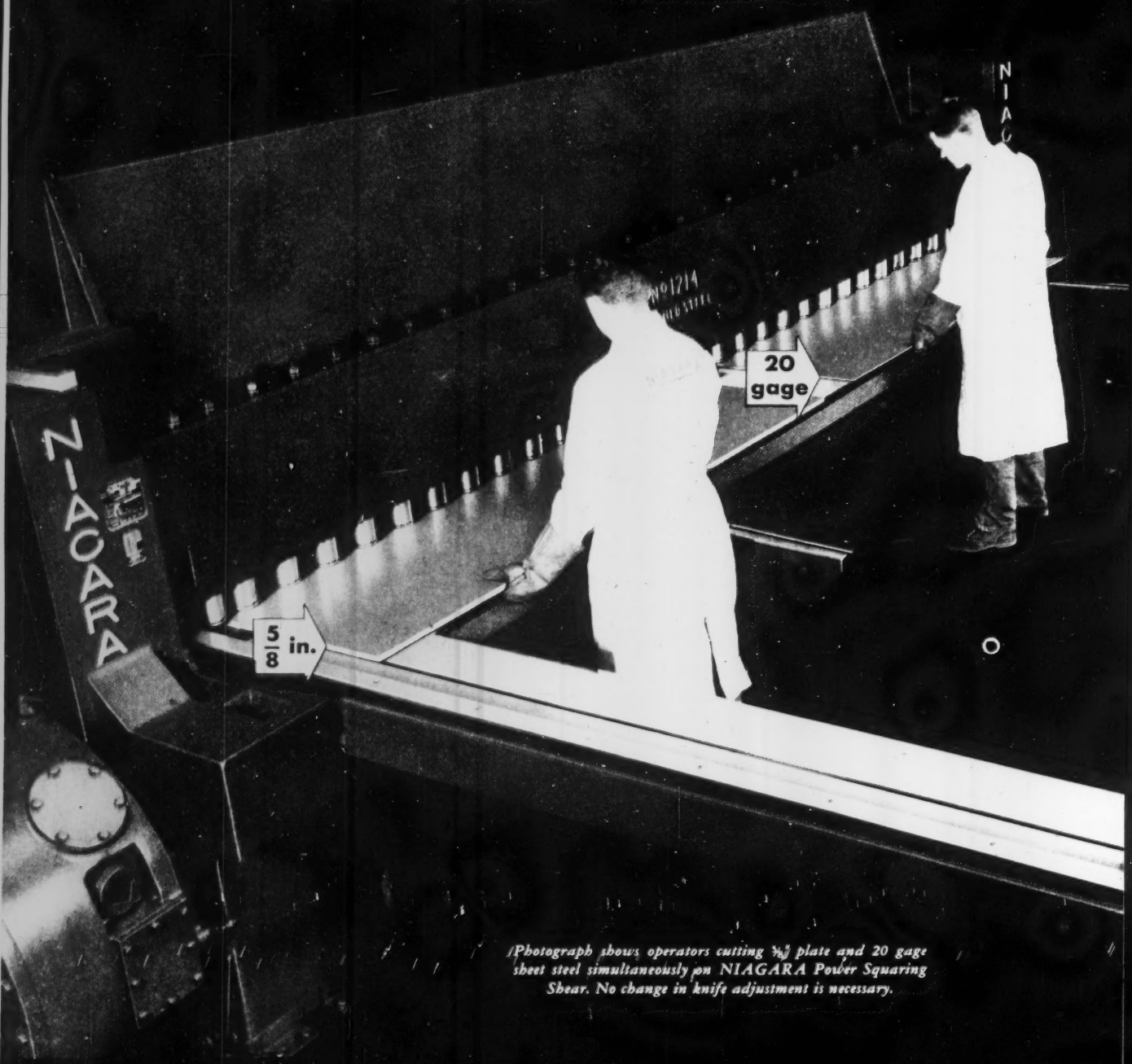
SINCE 1854

CUTTING 20 GAGE and 5/8 PLATE SIDE-BY-SIDE AT ONE STROKE



Photograph shows operators cutting ⅝" plate and 20 gage sheet steel simultaneously on NIAGARA Power Squaring Shear. No change in knife adjustment is necessary.

The ability of Niagara Power Squaring Shears to cut thick and thin plate both at the same time with the same knife setting is a dramatic demonstration. Visitors at our plant can see this done every day. There is no necessity for tinkering with the knife adjustment.

Demonstrates The Sound Engineering Design of

NIAGARA

POWER SQUARING SHEARS

● There is no compromise with sound, proven engineering when it comes to NIAGARA shear design and construction.

Accurate cutting depends primarily on rigidity of the shear's components.

For bed, crosshead and holddown NIAGARA uses CLOSED BOX SECTIONS to resist with minimum deflection the horizontal, vertical and diagonal or torsional loads to which every shear is subjected.

NO OTHER SECTION WILL DO THIS JOB AS EFFICIENTLY.

Angle or channel shaped sections have long since been abandoned for use on NIAGARA Power Shears.

The economy of quality is remembered long after price is forgotten.

BED, CROSSHEAD & HOLDDOWN DESIGN

NIAGARA MACHINE AND TOOL WORKS, BUFFALO 11, NEW YORK

DISTRICT OFFICES: DETROIT, CLEVELAND, NEW YORK

be sure it is **THE** bearing!

"THE BEARING" will probably be a Johnson Sleeve Bearing, designed specifically for the application. There are several important factors involved in the selection of the correct bearing for any job . . . principally service conditions. Operating speed, temperatures, corrosive conditions, load, shock . . . all must be carefully considered. Since Johnson Bronze produces all types of sleeve bearings, uses all types of bearing metals, their engineers will give you unbiased advice and will assist you in designing the correct sleeve bearing for your application. Write, wire or phone for an appointment with a Johnson Bearing Specialist.

JOHNSON BRONZE COMPANY
550 South Mill St., New Castle, Pa.

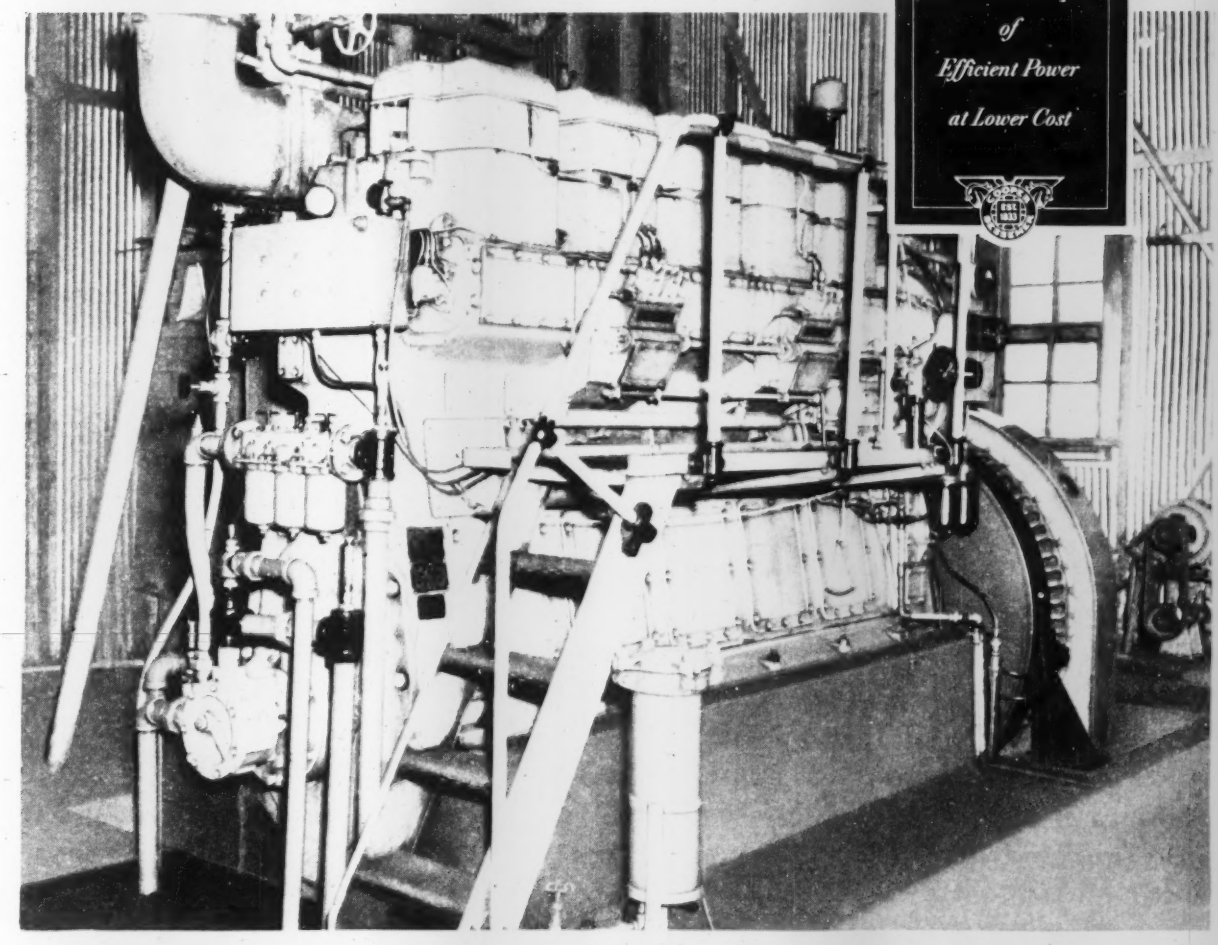
BRONZE ON STEEL
—copper lead
STEEL BACK
—babbitt lined
BRONZE BACK
—babbitt lined
CAST BRONZE
ALUMINUM ALLOY
LEDALOYL
—powder metallurgy

JOHNSON JB BEARINGS
Sleeve Type

SLEEVE BEARING HEADQUARTERS SINCE 1901

Installed at Uvalde Rock Asphalt Company's quarry, Blewett, Texas, this 430 hp Cooper-Bessemer JS-5 diesel drives a 300 kw generator for general power requirements.

Another Example of Efficient Power at Lower Cost



Steady worker, good at keeping costs DOWN!

THE Uvalde Rock Asphalt Company, which produces about 500,000 tons of limestone rock asphalt a year, needed a diesel that would stand up to steady work month in, month out. And that's just what they have in the Cooper-Bessemer JS-5 shown above. This efficient, husky diesel, installed in 1946, has done a steady job right from its initial start, with a very minimum of attention and replacement parts. Like other Cooper-Bessemer engine types, larger and smaller, the JS consistently shows records of low-cost operation. It has all the Cooper-Bessemer features that pay off every time.

The **Cooper-Bessemer** *Corporation*

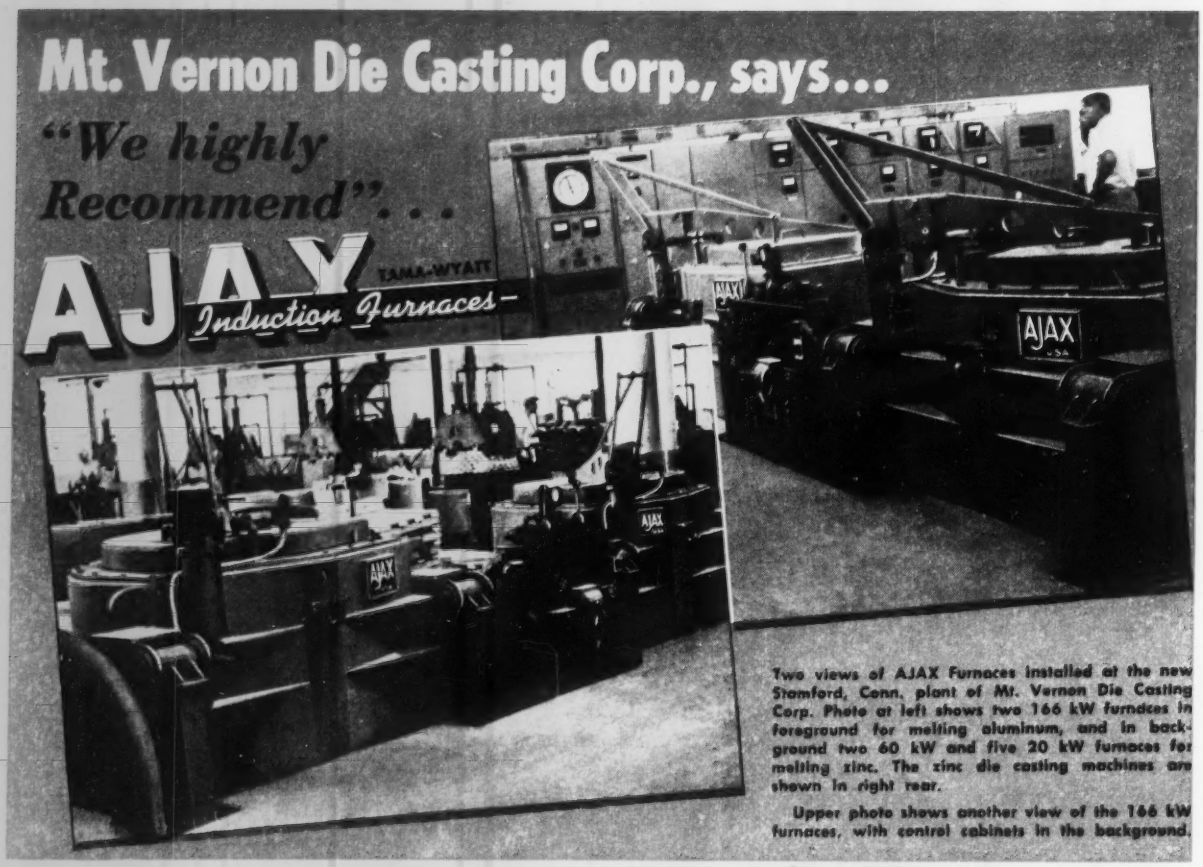
MOUNT VERNON, OHIO — GROVE CITY, PENNA.

New York Washington, D. C. Bradford, Pa. San Francisco Houston, Dallas, Greggton, Pampa and Odessa, Texas Seattle Tulsa Shreveport St. Louis Los Angeles Chicago Caracas, Venezuela Cooper-Bessemer of Canada, Ltd., Halifax, Nova Scotia Gloucester, Mass. New Orleans, La.

Mt. Vernon Die Casting Corp., says...

"We highly Recommend"...

AJAX TAMA-WYATT *Induction Furnaces*



Two views of AJAX Furnaces installed at the new Stamford, Conn. plant of Mt. Vernon Die Casting Corp. Photo at left shows two 166 kW furnaces in foreground for melting aluminum, and in background two 60 kW and five 20 kW furnaces for melting zinc. The zinc die casting machines are shown in right rear.

Upper photo shows another view of the 166 kW furnaces, with control cabinets in the background.

After a most satisfactory experience of more than five years with AJAX *low frequency* Induction Furnaces in their Mt. Vernon, New York plant, this company has now installed the furnaces shown above in their new modern plant at Stamford, Conn. "We are convinced," they state, "that economy of operation makes this type of furnace well worth while. We intend to continue to install them till all our die casting machines are fed by AJAX furnaces."

AJAX induction melting and holding furnaces are finding wide acceptance in the American die casting industry. Experience has shown that they greatly improve the overall performance. In particular, the absence of fumes and reduction of radiant heat give greater comfort to the operators. Electricity is one of the few commodities which have not increased in price in recent years.

Agitation, due to internal electrical stirring, insures uniform temperature and homogeneous mixing of the ingredients. Since linings are made of inert refractories, they cannot contaminate the melt. Temperature control is entirely automatic and keeps the molten mass within ± 5° F., holding the metal at the lowest feasible casting temperature.

Amazingly low maintenance is the rule. Some furnaces operate for as long as 7 years without renewal of refractory lining. Rejects and metal losses are extremely low.

AJAX TAMA-WYATT

AJAX ENGINEERING CORP., TRENTON 7, N. J.

INDUCTION MELTING FURNACE

AJAX ELECTRO METALLURGICAL CORP., and Associated Companies
AJAX ELECTROTHERMIC CORP., Ajax Northrup High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax Multiphase Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax Wyatt Induction Furnaces for Melting

IN PITTSBURGH'S GOLDEN TRIANGLE . . .

34,200 Tons of Steel Frame Construction by AMERICAN BRIDGE in 24 months!

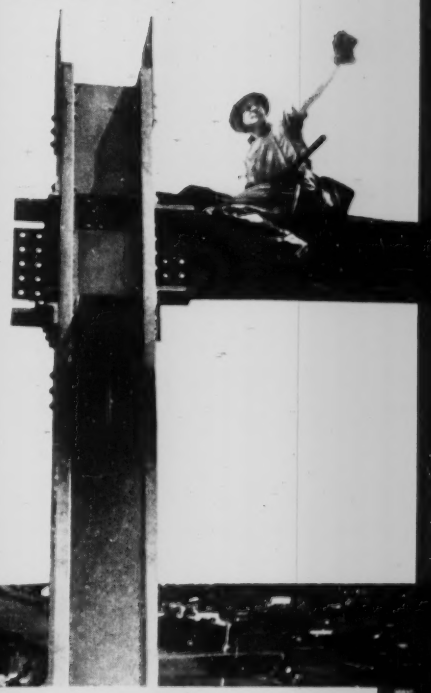
PITTSBURGH'S new buildings have been the talk of the business world. Few cities anywhere have experienced as much commercial construction in so short a time.

For example, in the famous Golden Triangle, busy hub of this bustling metropolis, American Bridge alone erected 34,200 tons of steel framework for six towering new buildings in the two year period between April 3, 1950 and March 31, 1952.

American Bridge fabricated and erected all structural steel for the 41-story building known as 525 William Penn Place; the 31-story Alcoa building; the three Gateway Center buildings (one of which is 24-stories, and two 20-stories); and the 20-story Bigelow Apartment House.

Such an accomplishment is unusual only in the fact that all buildings are located in the downtown area of a single city . . . and that all were under construction at practically the same time. The interesting point is that one company had the facilities, the skilled manpower, and the engineering know-how to handle six sizable jobs like these with such speed and efficiency without disrupting the time schedule of the numerous other construction projects which it was handling in other parts of the country.

It only goes to prove that no job is too large for American Bridge. If you would like to know more about the advantages of American Bridge fabricated and erected construction, call our nearest office.



RECENT ADDITIONS TO PITTSBURGH'S SKYLINE

525 William Penn Place
14,000 tons of Structural Steel

Alcoa Building
6,400 tons of Structural Steel

Gateway Center Buildings (3)
12,000 tons of Structural Steel

Bigelow Apartment House
1,800 tons of Structural Steel

AMERICAN BRIDGE DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: 525 WILLIAM PENN PLACE, PITTSBURGH, PA.
Contracting Offices in: AMBRIDGE · ATLANTA · BALTIMORE · BIRMINGHAM · BOSTON
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UNITED STATES STEEL EXPORT COMPANY, NEW YORK

AVAILABLE NOW! For showing in churches, schools, clubs and industry, the new sound and color motion picture *BUILDING FOR THE NATIONS*—a candid, factual moving picture record of the building of the fabrication and erection of the United Nations Secretariat Building. For free bookings, write Pittsburgh office.

AMERICAN BRIDGE

USS

UNITED STATES STEEL

NOW!

Palletized

Silicon Briquets

EASY TO HANDLE

EASY TO USE

A new rectangular-shaped briquet for stacking and shipping on pallets is now produced by ELECTROMET. Pallet shipments are convenient and economical to handle. The pallets hold approximately 4,000 lb. of "EM" silicon briquets and are available at no extra charge over bulk shipments. They can easily be unloaded and handled in your plant by lift truck or overhead crane. Handling time and costs are reduced and inventory-taking is simplified. The pallets are expendable and need not be returned.

"EM" palletized silicon briquets are 6 in. x 3 in. x 2 in. in size, weigh 5 lb. gross, and contain 2 lb. of silicon. The briquets are notched, so that they can easily be split in half when 1 lb. additions of silicon are desired. Because they contain an exact amount of silicon, these briquets offer close control of analysis in cupola melting operations.

Phone, wire, or write the nearest ELECTROMET office listed below for further information on how you can save with palletized silicon briquets.

The terms "Electromet" and "EM" are registered trade-marks of Union Carbide and Carbon Corporation.

ELECTRO METALLURGICAL COMPANY

A Division of Union Carbide and Carbon Corporation

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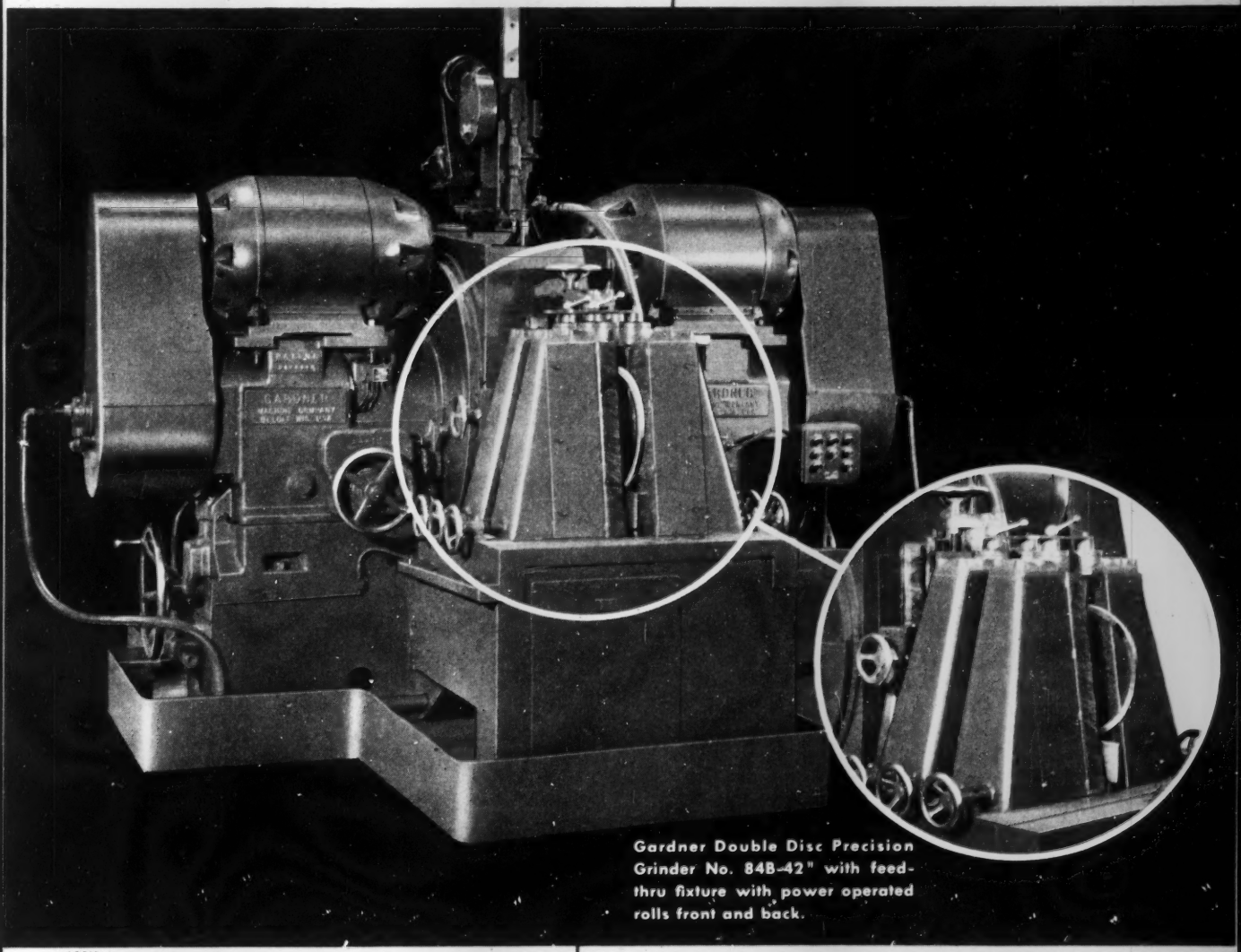
Grinding Time Reduced 50% By Change to Gardner Method

Replaces one side at a time process

Unit costs reduced by grinding TWO parallel surfaces in ONE operation

Automotive flywheel ring gears of 15.049" O.D. x 14.216" I.D. x .568" thick are ground from rough steel forgings. .036" overall stock removed in 4 passes at rate of 135 finished pieces per hour. Tolerances: .001" to .002" for parallelism, .005" for uniformity.



Gardner Double Disc Precision Grinder No. 84B-42" with feed-thru fixture with power operated rolls front and back.

125M

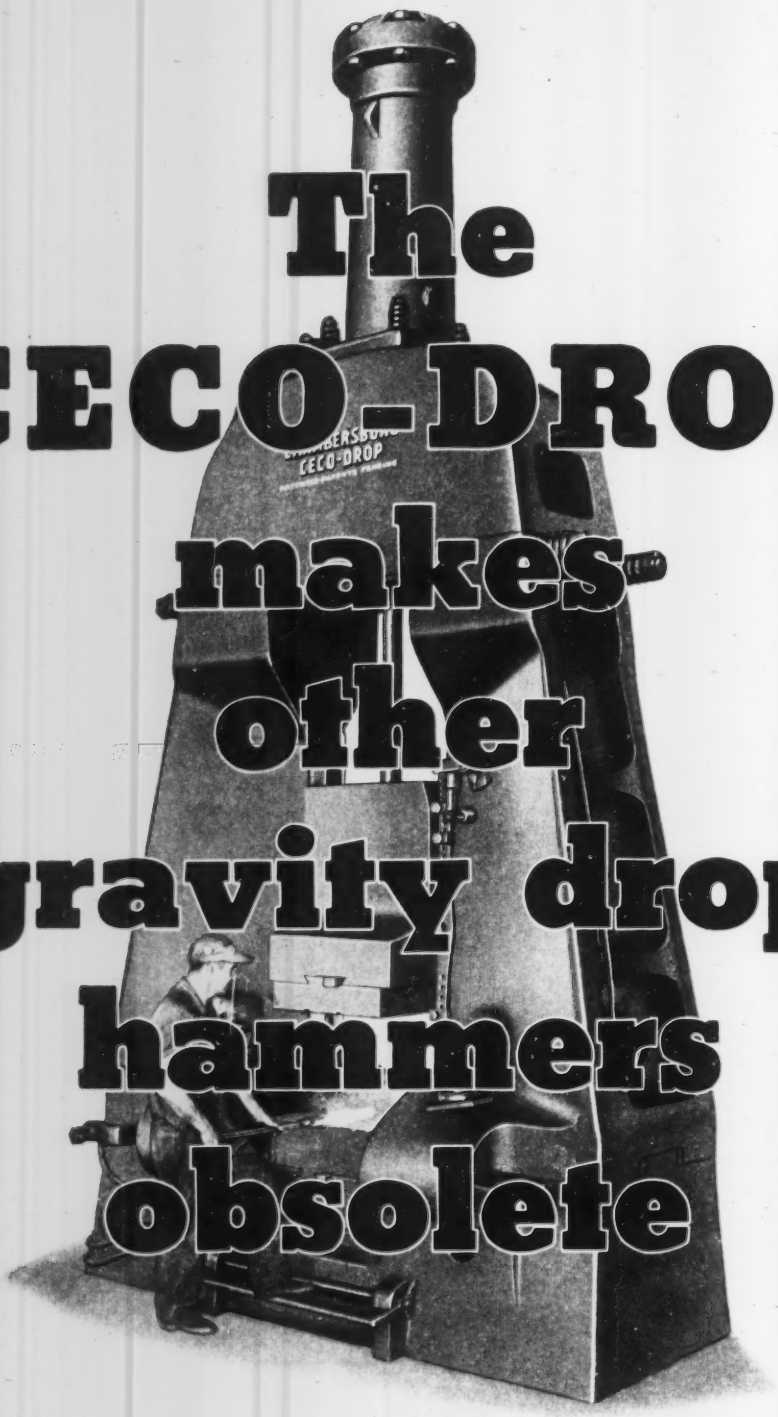
Request Catalog D-53.

GARDNER MACHINE COMPANY
420 Gardner St., Beloit, Wisconsin, U. S. A.

GARDNER

precision disc **Grinders**

The CECO-DROP makes other gravity drop hammers obsolete



Builders of THE IMPACTER

"FORGING IN MID-AIR"

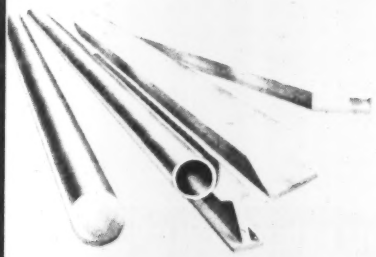
CHAMBERSBURG ENGINEERING CO., CHAMBERSBURG, PA.

the

metal

you

need



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CENTRAL STEEL

AND WIRE COMPANY

- *cut-to-order*
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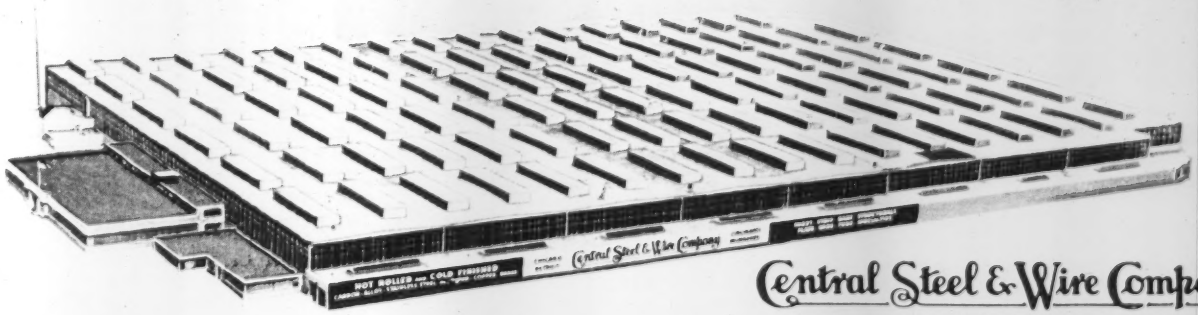
to exact specifications



Central Steel & Wire Company

Plants and Offices

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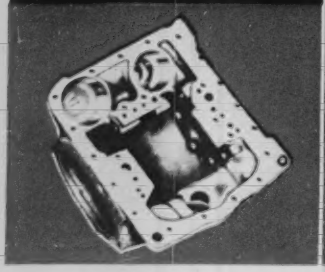
DETROIT 12, MICH. 11400 Mt. Elliott Ave. TWinbrook 2-1200

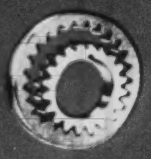
CINCINNATI 14, OHIO Box 148 Annex Sta. AVon 2210

MILWAUKEE 1, WIS. Box 1154 EVergreen 4-7400

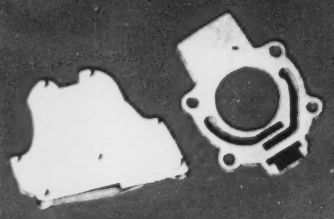
TRANSMISSION CASE (CAST IRON) THREE TYPE I, ONE TYPE III SURFACES



PUMP GEARS (CAST IRON; STEEL) SIDE SURFACES, TYPE IV



TRANSMISSION COVER AND GOVERNOR BODY (BOTH ALUMINUM) TYPE III SURFACES



PINION GEARS (HARDENED STEEL) THREE TYPE II, TWO TYPE IV SURFACES

FOR PRECISION FINISHING OF FUNCTIONAL SURFACES

PowerFlite transmission parts are *Microhoned*

Chrysler engineers, with years of proficiency in production-processing of precision parts, have specified the Microhoning process as the method for obtaining

✶ DIMENSIONAL ACCURACY ✶ GEOMETRIC PRECISION ✶ CONTROLLED SURFACE FINISH

required for the efficient functioning of the new PowerFlite transmission.

FOUR TYPES OF SURFACES IN THE *PowerFlite* ARE MICROHONED:

Type I—Cylindrical surfaces through which a piston or valve moves.

These surfaces must be round, straight and accurately sized, with a controlled surface finish—in order to minimize wear and eliminate oil leakage. The Microhoned finish assures non flaking surfaces between the stationary and moving parts.

Type II—Cylindrical surfaces in rotating parts.

Microhoning maintains concentricity of pitch diameter of teeth and the bore of gears, permitting teeth to mesh with minimum noise and wear. The bore must have precise geometry, size, and functional finish to retain a lubricating film at high speed.

Type III—Flat surfaces that are bolted together without a gasket.

They must be flat enough so that they will not distort when pulled together, and must have a surface finish that will mate to form a tight, effective seal.

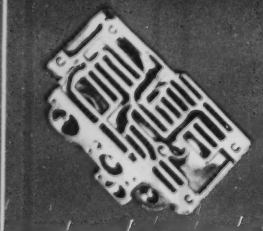
Type IV—Flat surfaces that move in contact with stationary surfaces.

These must be smooth and flat in order to minimize friction and wear, and maintain a "running seal", thus eliminating leakage.

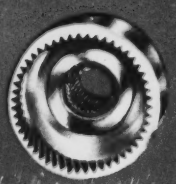
For more information on the Microhoning process write to:
Field Engineering B7
Micromatic Hone Corporation
8100 Schoolcraft Avenue
Detroit 38, Michigan

PRECISION PRODUCTION THROUGH MICROHONING
MICRO MATIC

VALVE BODY (ALUMINUM) TWO TYPE III, ONE TYPE I SURFACES



KICK-DOWN GEARS (STEEL) TYPE IV SURFACES



TRANSFER PLATE AND REGULATOR BODY (BOTH STEEL) TYPE III SURFACES

MICROHONING MACHINES • TOOLS • FIXTURES • ABRASIVES

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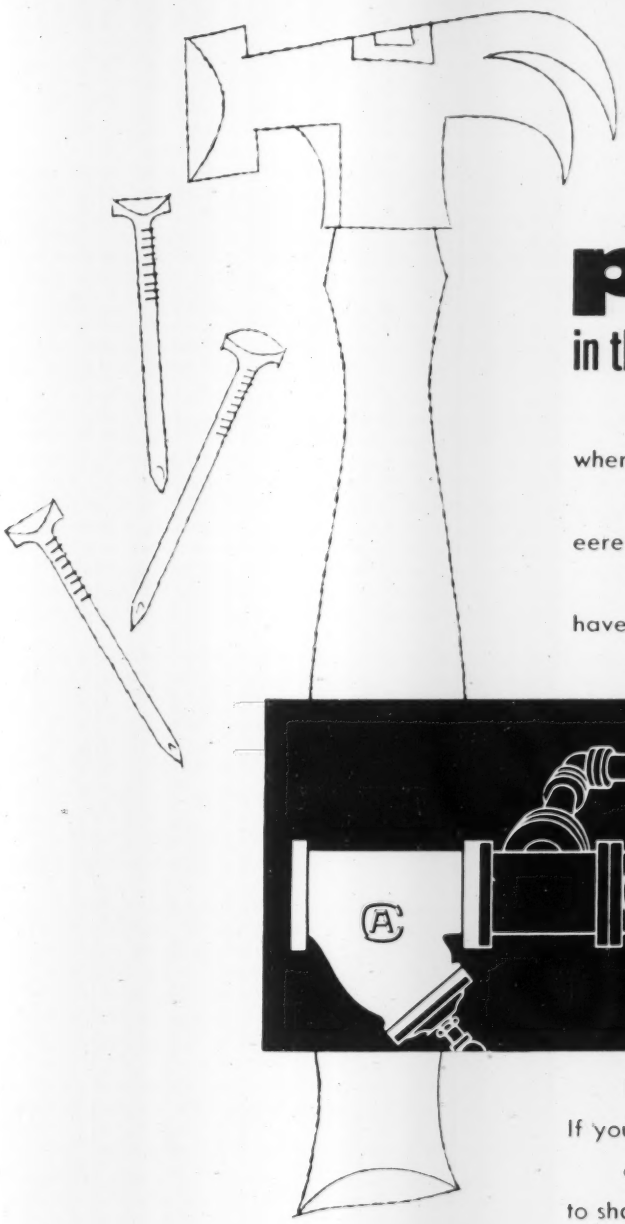
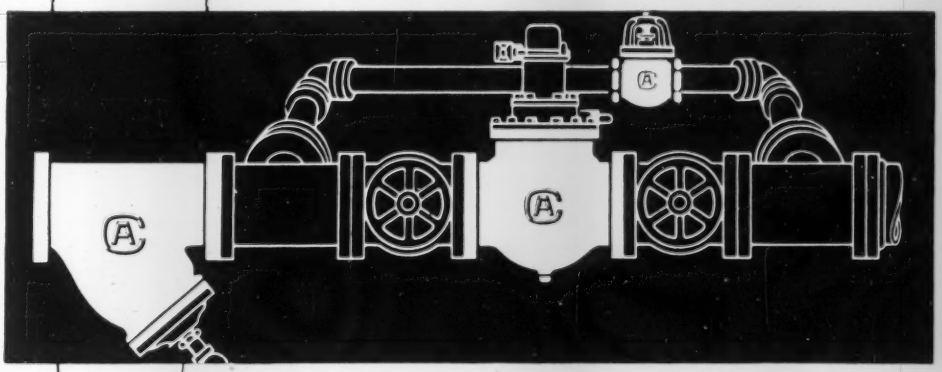
Overgard Machine Tool Company, 234 Commonwealth Bldg., Denver 2, Colorado • Allied Northwest Machine Tool Corp., 103 S. W. Front Ave., Portland 4, Oregon
REPRESENTATIVES IN ALL PRINCIPAL COUNTRIES



partners

in the manufacture of SPECIALTY VALVES

In every branch of the chemical process industries where the control of corrosive or abrasive fluids is a problem, it takes many types of specially engineered valves to do the job right. From the very beginning, Cooper Alloy design and foundry engineers have worked hand in hand with manufacturers of specialty valves to insure the production of stainless steel components that could be relied upon. If you design or manufacture control, safety, relief, or other special stainless steel valves, we invite you to share our know-how and experience. Write for your free copy of "Thirty Years of Progress", a booklet designed to give you a quick glimpse of our facilities.



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THE COOPER ALLOY FOUNDRY CO. • HILLSIDE, N. J.

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Leading producers of STAINLESS STEEL valves, fittings and castings

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Name Position

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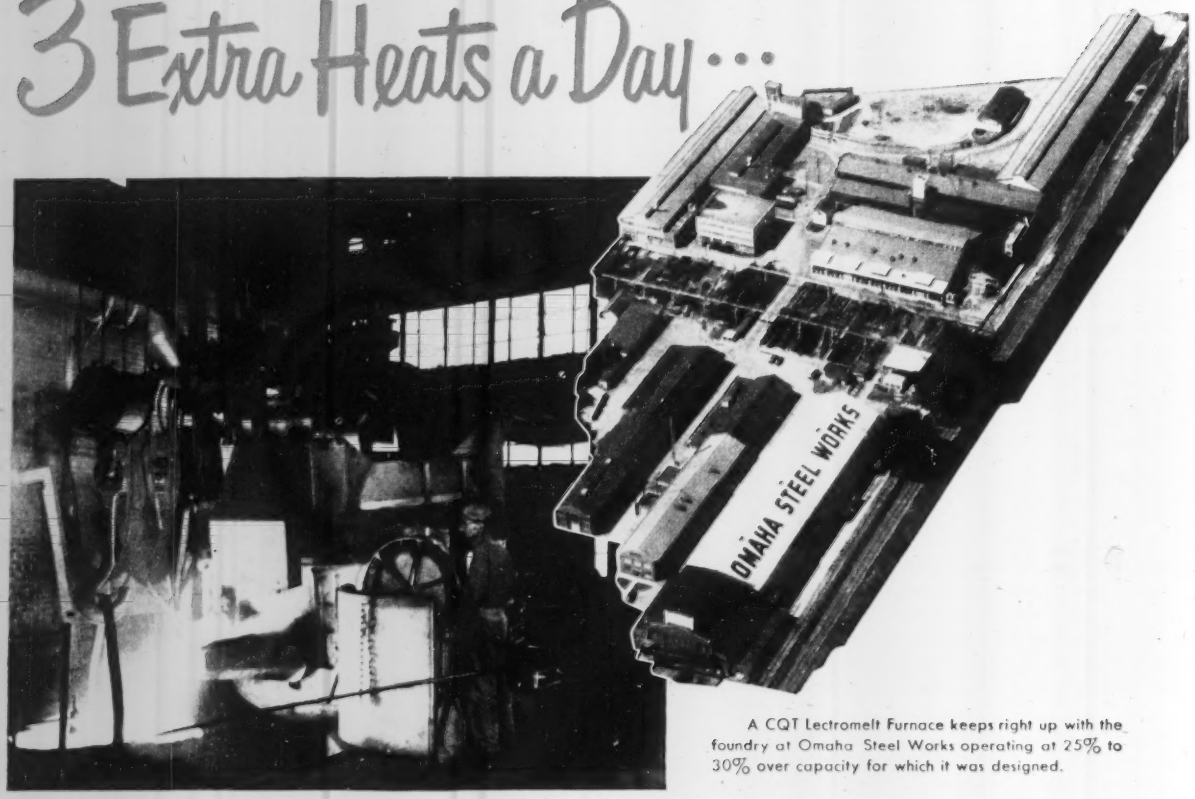
SV1

Their *Lectromelt** Furnace gives them

3 Extra Heats a Day...



A CQT Lectromelt Furnace keeps right up with the foundry at Omaha Steel Works operating at 25% to 30% over capacity for which it was designed.

At Omaha Steel they laid out the foundry to produce five heats per day. Then, they proceeded to operate at 25% to 30% over capacity. Their Lectromelt Furnace keeps pace with above-capacity production, averaging eight heats per day.

Lectromelt Furnaces are known for their ability to take on extra work when you must meet demanding schedules. Even when handling higher power loads and while turning out extra tonnage, a Lectromelt still gives trouble-free performance.

Metals melting is easier and more profitable when you use Lectromelt Furnaces because additional ruggedness and dependability are engineered into each furnace while it's in the design stage. You get a sturdy furnace with these added advantages:

1. Precise temperature and analysis control.
2. Top-charging to save man-hours, power, electrodes and furnace lining.
3. Power supply and regulation equipment specifically engineered and built to fit each installation.
4. Counterbalanced electrode arms.
5. Separately mounted roof lift and swing mechanism.
6. Side-mounted tilting mechanism.
7. Each furnace is assembled in our factory prior to delivery.

Write for our catalog No. 9. It describes all types of Lectromelt Melting Furnaces and their operation. Pittsburgh Lectromelt Furnace Corporation, 323 32nd Street, Pittsburgh 30, Pennsylvania.

Manufactured in . . . CANADA: Lectromelt Furnaces of Canada, Ltd., Toronto 2 . . . ENGLAND: Birlec, Ltd., Birmingham . . . FRANCE: Stein et Roubaix, Paris . . . BELGIUM: S. A. Belge Stein et Roubaix, Bressoux-Liege . . . SPAIN: General Electrica Espanola, Bilbao . . . ITALY: Forni Stein, Genoa. JAPAN: Daido Steel Co., Ltd., Nagoya

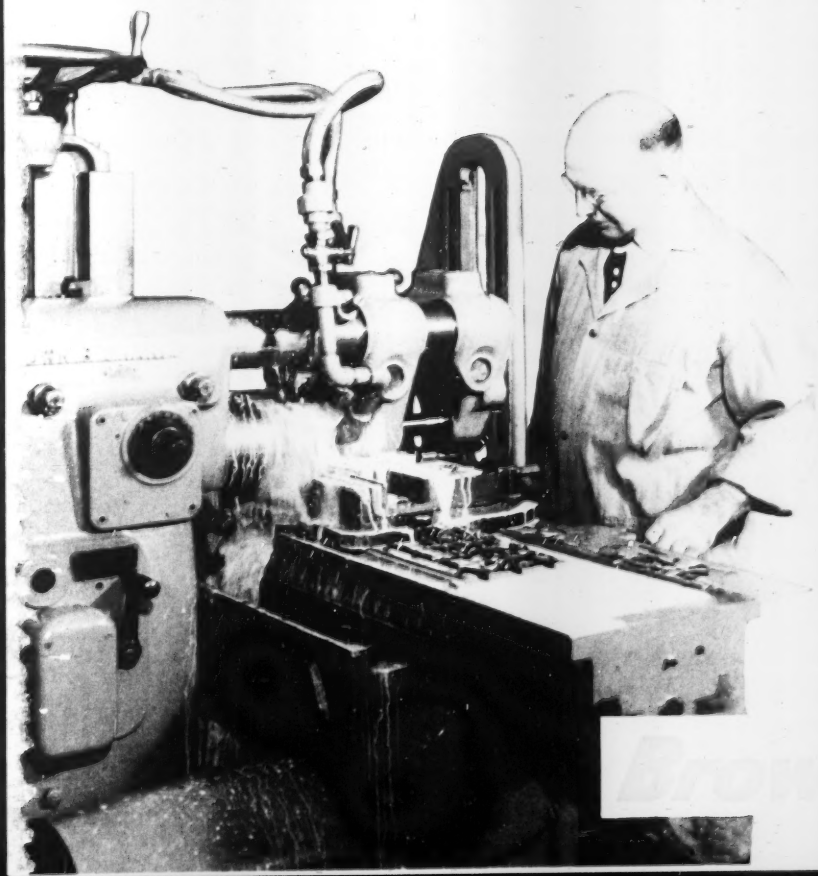
*REG. U.S. PAT. OFF.

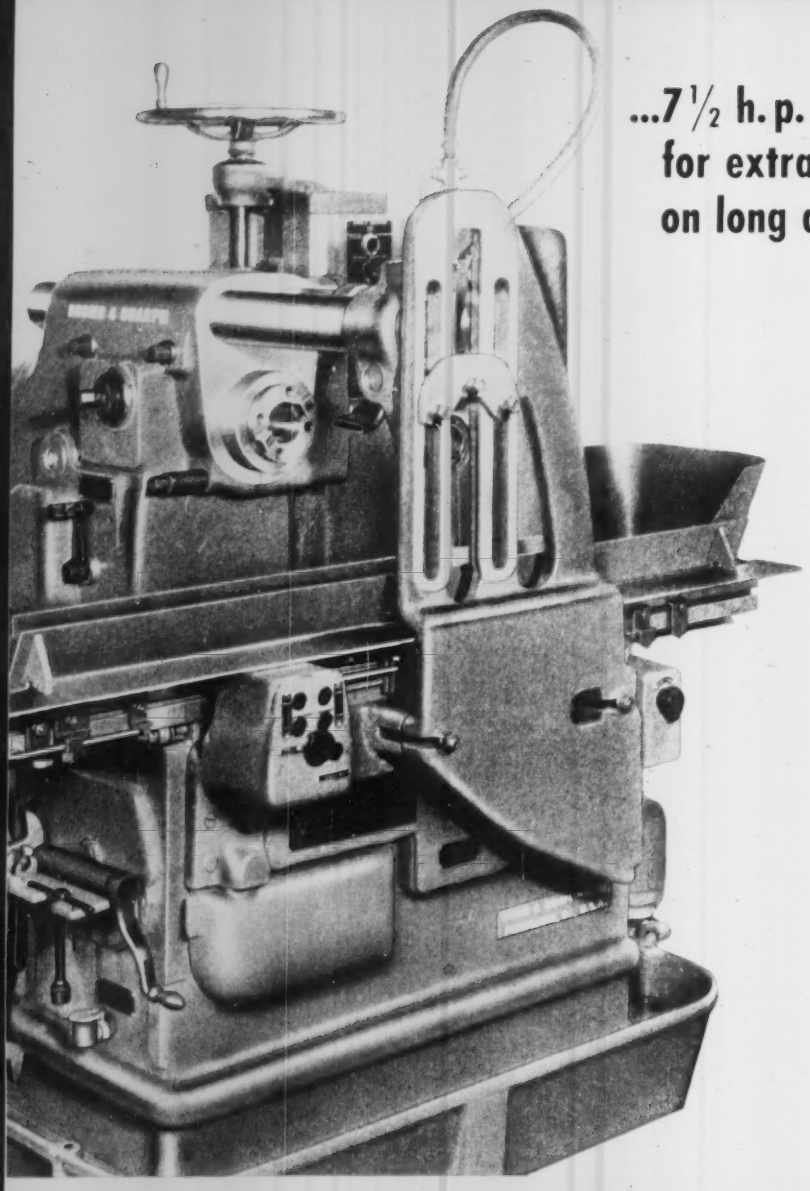
MOORE RAPID

WHEN YOU MELT... *Lectromelt*

POWERFUL

No. 12 manufacturing type
milling machine

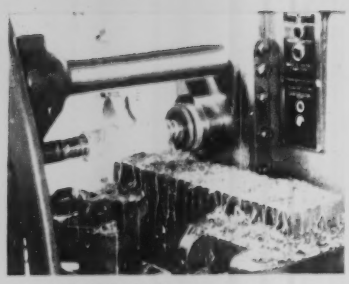




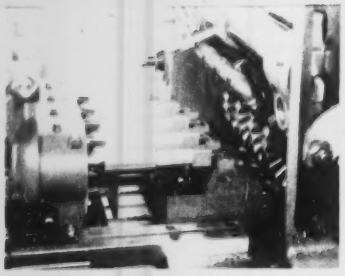
...7½ h.p. right at the spindle for extra fast milling on long and short run jobs

hrough extra power and simplified operation, this machine gives you important competitive advantages for meeting today's production schedules.

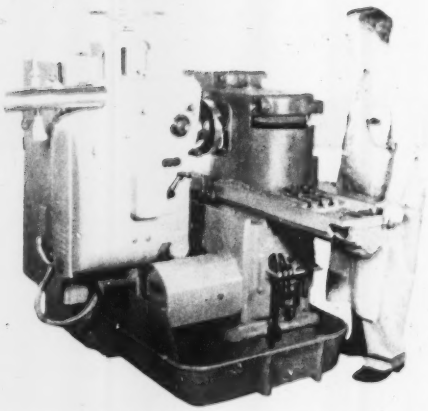
It allows you to take heavy cuts at fast feeds on a wide variety of medium sized work . . . quick set-ups are assured by many time saving features. All power movements are electrically controlled giving you exceptionally precise, rapid operation. Dual feed rates, a variety of automatic cycles, and the ability to climb mill in either direction are just a few of its advanced conveniences. Maximum cutting efficiency is assured through a wide choice of feeds and speeds. Write for complete details on the powerful No. 12 Plain Milling Machine — 7½ H.P. Spindle Drive.



POWERFUL CUT being made on a No. 12, 7½ h.p. Milling Machine. Steel forging is 5" wide and cutter removes ¼" of stock at a fast feed.



SPECIAL FIXTURES like this for automatically indexing and milling squares on taps, make the No. 12 a still higher production machine.



HIGH SPEED MILLING of casting on the powerful No. 12 using carbide-tipped face milling cutter.

Milling Machines • Grinding Machines • Screw Machines • Cutters • Machine Tool Accessories
Machinists' Tools • Electronic Measuring Equipment • Johansson Gage Blocks • Permanent Magnet Chucks • Pumps

BROWN & SHARPE MFG. CO., PROVIDENCE 1, R. I., U.S.A.

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NO BETTER BLADES OR BANDS

Starrett®

You can't buy better hacksaws, band saws or band knives than STARRETT. They're precision made by the "World's Greatest Toolmakers" in a new streamlined plant to give you a lot more clean, fast, trouble-free cutting. By simply specifying STARRETT blades or bands you can count on better, faster production —less cost—less time out for blade changing . . . whether you cut, saw or slice.

NO HANDIER SOURCE OF SUPPLY

Your Industrial Distributor

Because your local industrial distributor stocks and sells the complete Starrett line, you can always count on prompt, dependable, quality service. He'll gladly suggest the one best, most economical blade or band for your cutting operations. The complete line includes hacksaws for hand or power cutting — band saws for cutting metal, wood, plastics, contour cutting, friction sawing, etc. — and band knives for cutting soft or fibrous materials.

GUIDES TO BETTER CUTTING
Write for the Starrett Hacksaw and Band Saw Catalog and Quick Reference Metal Cutting Guide. Address Dept. BG.

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TRADE MARK
Starrett
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SINCE 1880
WORLD'S GREATEST TOOLMAKERS

THE L. S. STARRETT COMPANY
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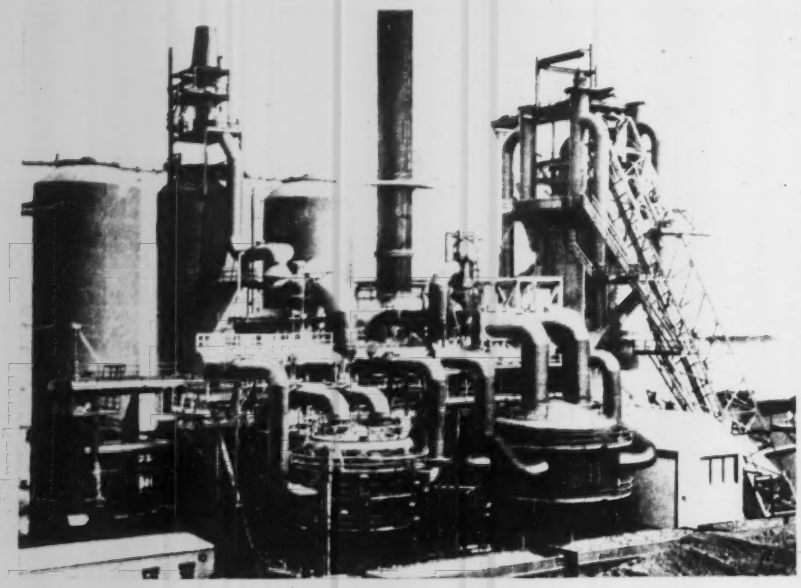


How Cottrell Precipitators Clean Gas in the Steel Industry

Iron Ore Sintering Plants

The first commercial Cottrell installation for cleaning gases coming from the iron ore sintering machines was placed in operation in 1952 with collection efficiencies exceeding 95%. In this installation the gases leaving the windboxes of the sintering machine pass to a flue, then to a mechanical collector, to the induced draft fans, to the precipitator, and then to stack. The gases enter the precipitator at temperatures of about 250 to 300F, with water vapor content of about 8%. The dust collected is dry and quite fine. The precipitators used on this application are of the horizontal steel plate type.

Iron Blast Furnaces

The cleaning plant in most iron blast furnace installations consists of the preliminary stage (dry dust catchers), the primary stage (water scrubbers) and the secondary stage (water-flushed Cottrell Precipitators). Dust and fume content of the gas is reduced to the range of 0.1 to 0.3 grains per cubic foot of gas corrected to standard conditions before it reaches the Electrical Precipitator. The function of the precipitator is to further clean this gas to a final dust content ranging in most cases from 0.005 to 0.01 grains per cubic foot, depending on how the gas is to be used.

Open Hearths

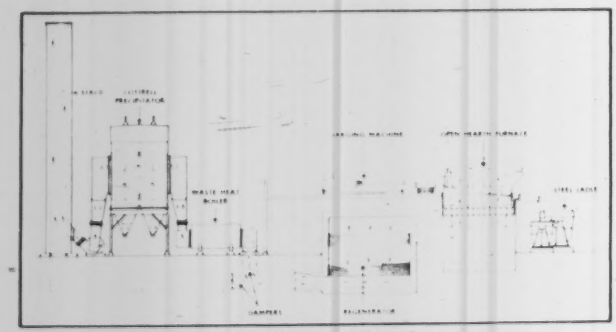
This problem involves the cleaning of combustion gases coming from furnaces, usually oil-fired, and carrying in suspension a heterogeneous mixture of very fine metallic oxides.

After extensive research and pilot plant studies, Research Corporation completed the first commercial precipitator installation for cleaning open hearth gases in 1951. Test results at rating indicated efficiencies of over 95% were obtained. Most of the time there was no visible discharge.

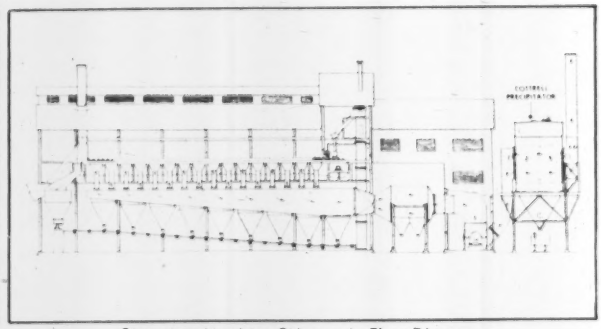
Other Steel Applications

In addition to the above, Research Corporation Cottrell installations are being used for detarring by-product coke oven gas, cleaning oven fuel gas and producer gas, and cleaning ferromanganese blast furnace gas.

Detailed information on all these applications is available through your nearest Research Corporation office.



Open Hearth Schematic Flow Diagram



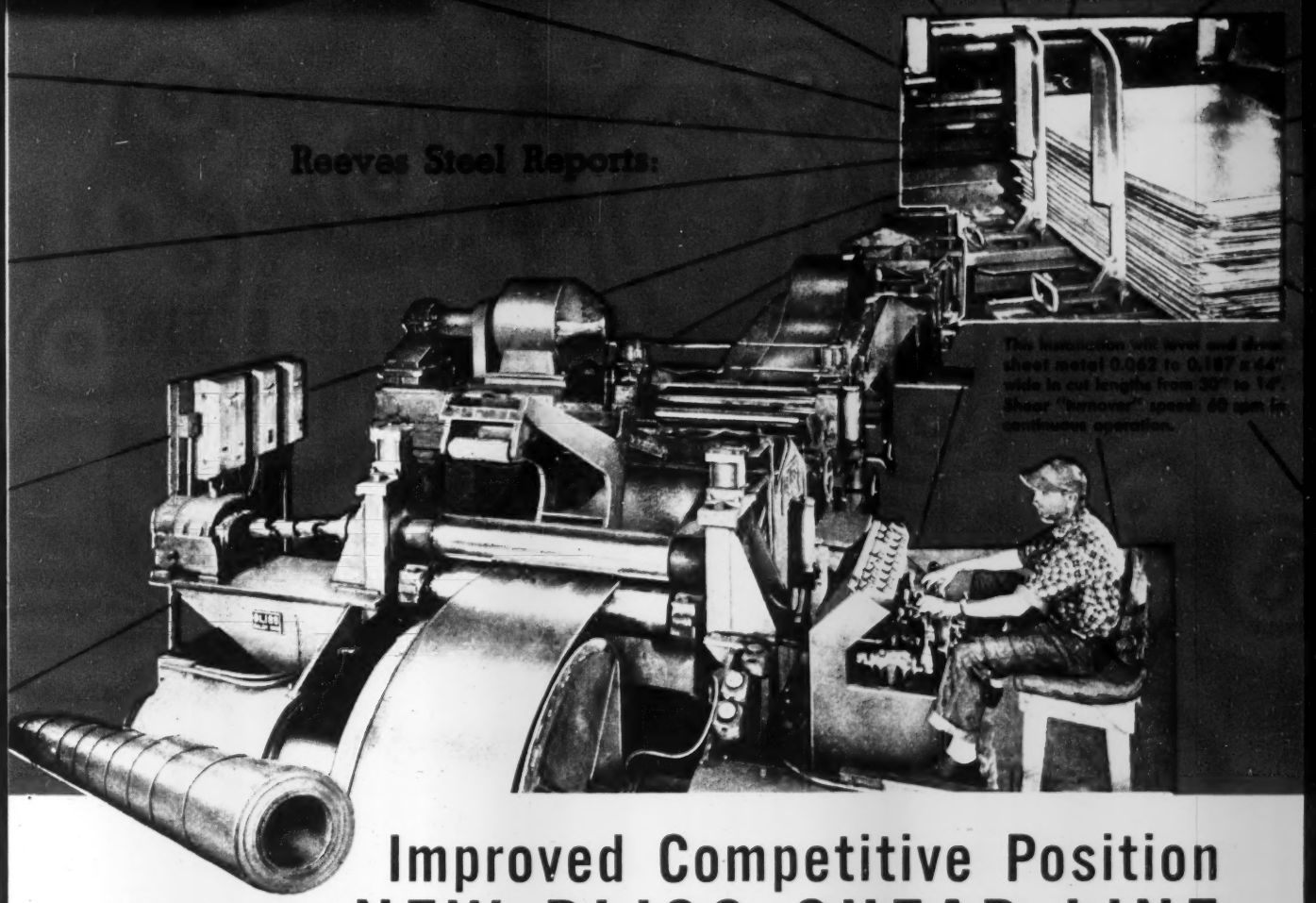
Sintering Machine Schematic Flow Diagram

RESEARCH CORPORATION

405 Lexington Avenue, New York 17, N. Y. • Bound Brook, N. J.

Grant Building, Pittsburgh 19, Pa. • 122 South Michigan Avenue, Chicago 3, Ill.

RC145



This installation will level and shear sheet metal 0.062 to 0.187 x 44" wide in cut lengths from 20" to 14'. Shear "turnover" speed: 60 spm in continuous operation.

Improved Competitive Position through NEW BLISS SHEAR LINE

Coil is transformed into stacked, cut sheets at rates up to 200 fpm

Installing this shear line engineered to their own requirements and switching steel purchases from pre-cut blanks to coiled stock, Reeves Steel and Manufacturing Company of Dover, Ohio, profited three ways:

- They gained control of an important phase of their production while amortizing their own equipment.
- They eliminated the mill's "extra" charges.
- They reduced expenses of storage and record keeping.

Like others, Reeves chose Bliss after comparison with standardized machinery. Nine* vital operations assuring scratch-free surfaces, blanks of uniform flatness and perfect shearing explain why.

Such clearly-defined benefits from Bliss engineering help to account for the prominence of Bliss rolling mill equipment throughout the metal-producing industry.

Although principally in use in steel plants, the Bliss shear line can be of equal advantage to manufacturers, fabricators and warehouses.

You can read a comprehensive description of this machinery in the revised Bliss Rolling Mill Brochure by simply sending for it today. It's likely you'll see there Bliss equipment relating to *your* problem. When you do, Bliss' Engineering Department is as handy as your telephone . . . wherever you are!

*(1) Coil conveyor delivers coil to (2) coil box pay-off. (3) Coil is threaded to leveler; (4) flattened; (5) is gaged to length; (6) cut; (7) conveyed and finish-levelled; (8) fed and (9) stacked for banding.

Remember: BLISS **for Presses, ROLLING MILLS, Special Machinery**

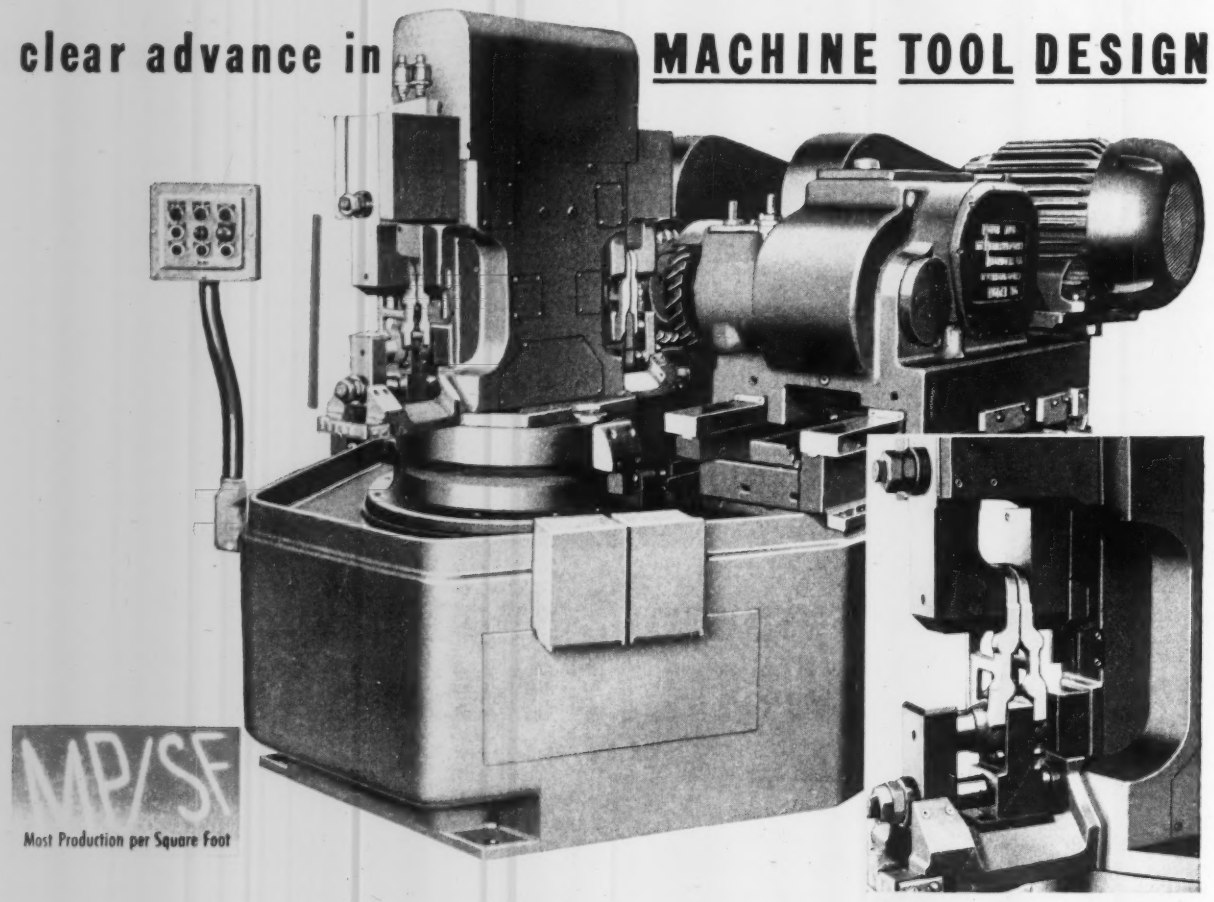
E. W. Bliss Company • General Office: Canton, Ohio

ROLLING MILL DIVISION: SALEM, OHIO

E. W. Bliss (England) Ltd., Derby, England • E. W. Bliss Company (Paris), St. Ouen sur Seine, France

U. S. Plants in Canton, Salem and Toledo, Ohio; and Hastings, Michigan. Branch Offices in Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Rochester, Toledo and Toronto, Canada. West Coast Representatives: Moore Machinery Co., Los Angeles and San Francisco; Star Machinery Company, Seattle. Other representatives throughout the world.

Every time—count upon MOTCH & MERRYWEATHER Engineering for a clear advance in MACHINE TOOL DESIGN



MP/SF
Most Production per Square Foot

Each machine tool built by us is charged with doing a specific job better than before and for less. To us that is a privilege a challenge an obligation. Every machine developed by the Motch & Merryweather engineering staff must earn a permanent place for itself in Industry must contribute permanently to a nation's advance in point of efficiency and economy must mark a visible step forward in machine tool design and construction . . . An example is outlined on this page.

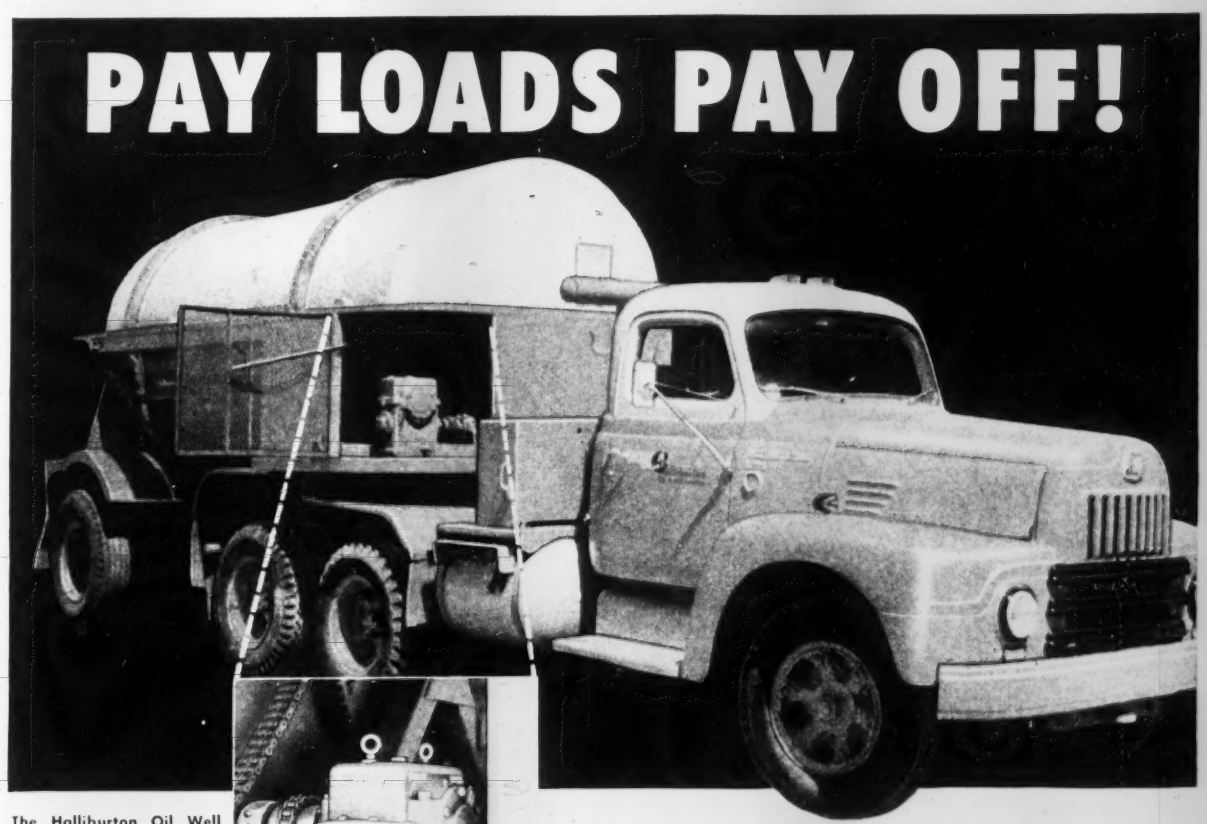
This M & M duplex production single-purpose milling machine mills two tractor side bars while two others are being loaded (removing at same station). Actually mills 70% of the time; up to 268 side bars per hour @ 100%. Two heads move, not the operator. Rigidity and power (30 h.p.) hike output. Fixtures to suit.

Manufactured by — THE MOTCH & MERRYWEATHER MACHINERY CO. —
CLEVELAND 13, OHIO
Builders of Circular Sawing Equipment, Production Milling, Turning and Special Machines

MMM

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

PAY LOADS PAY OFF!



The Halliburton Oil Well Cementing Co., Duncan, Okla., keeps cement at right consistency during travel by using specially-designed Rotovoy trucks. Power is transmitted as desired through rugged Hygrade Drives.

with HYGRADE DRIVES

Install 'em in your plant — even mount 'em on your trucks — *wherever* tough jobs call for rugged, space-saving drives — the Foote Bros. Hygrade line can solve your problem.

Hygrade worm gearing is skillfully engineered — precision generated — assures you greater efficiency, maximum power. Sturdy construction, improved design, compact housings — all offer you the savings on maintenance, the superior performance you've been looking for.

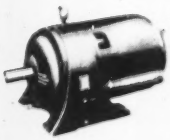
Hygrade Drives are available with horizontal or vertical output shafts — vertical extending upward, downward or both. Vertical Hytop units incorporate a wider, low-speed bearing span to accommodate long, unsupported extensions. Single, helical and double-worm reductions provide you with ratios up to 4,108 to 1 — capacities to 260 h.p.

For better drives for every job, see your Foote Bros. representative, or write for helpful information.

FOOTE BROS. Dust-Proof LIFETIME GEARING

This Trademark Stands for the Finest in Industrial Gearing

Line-O-Power Drives



Foote Bros.-Louis Allis Gearmotors

Maxi-Power Drives

FOOTE BROS.

Better Power Transmission Through Better Gears

FOOTE BROS. GEAR AND MACHINE CORPORATION
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Please send Bulletin HGB on Hygrade Drives.

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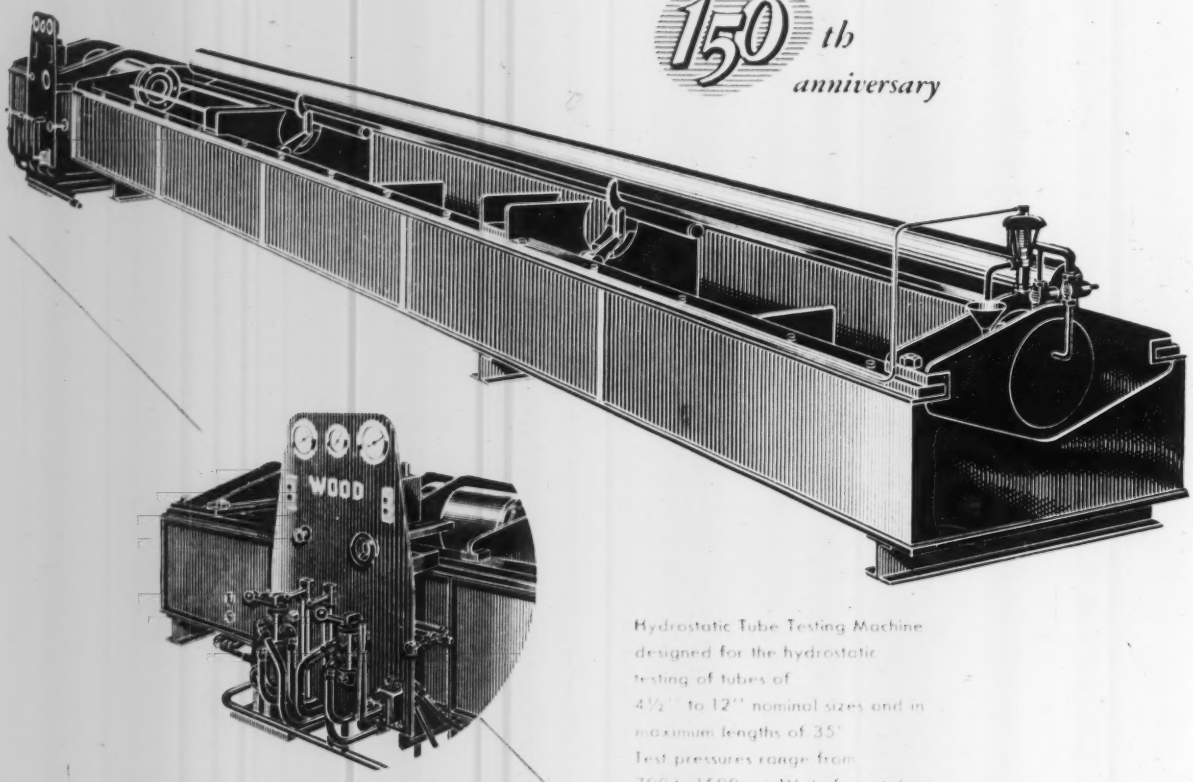

Hydrostatic Tube Testing Machine designed for the hydrostatic testing of tubes of 4½" to 12" nominal sizes and in maximum lengths of 35'. Test pressures range from 700 to 1500 psi. Write for catalogs of our hydraulic equipment.

R.D. Wood Hydrostatic Tube Tester

"... that industrial equipment which has maintained high excellence in manufacture will continue to be sold, and will contribute its worth to uplifting the general quality of everything produced in industrial America ..."

R. D. WOOD COMPANY

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WOOD

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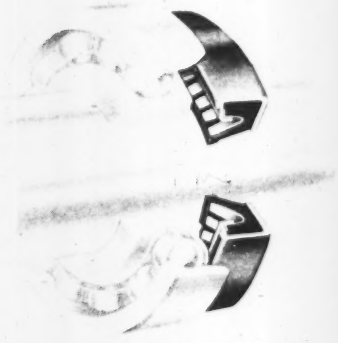
KLOZURE* Oil Seals

Dependable Bearing Protection for All Service Conditions

The true value of any oil seal must be measured by the ability of the sealing element to protect the bearing by keeping the lubricant *in*, dirt and moisture *out*.

For your bearing protection Garlock KLOZURES offer you these important sealing-element advantages:

1. **Synthetic rubber sealing elements** for oil, grease, water, mild acids and alkalies at temperatures up to 300° F.
2. **Silicone rubber sealing elements** for extremes of high and low temperatures.
3. **Teflon sealing elements** for strong acids.
4. **Choice of sealing element designs** with finger spring or garter spring for light, medium or heavy duty service at all speeds.
5. **All sealing elements** accurate and uniform in size, non-porous, tough, durable, non-abrasive and free-running.



Model 53 KLOZURE, with standard sealing element, applied to a shaft to protect the ball bearing.

Garlock KLOZURE Oil Seals are made in a complete range of sizes and in many models. For complete information call your Garlock representative or write for KLOZURE Catalog No. 10.

*Registered Trademark

THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK
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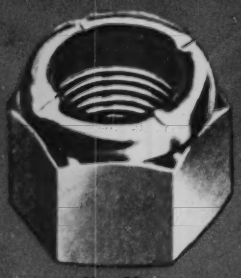
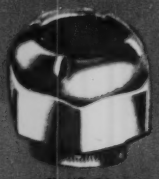
MECHANICAL SEALS,
RUBBER EXPANSION JOINTS

The Famous Red Elastic Collar

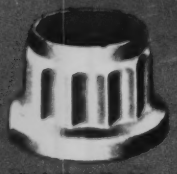


Hex Nut

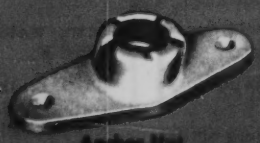
Spline Nut



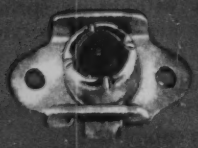
Clinch Nut



High Tensile Nut



Anchor Nut



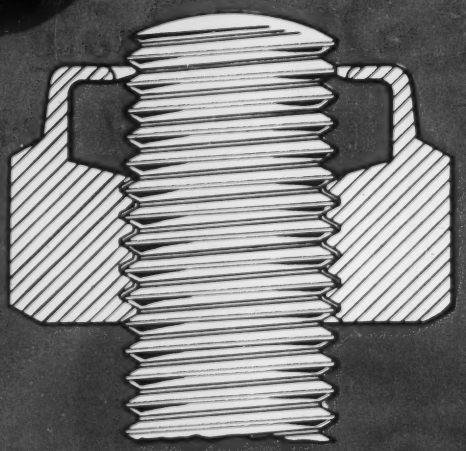
Floating Basket Nut

NYLON OR FIBER

. . . identifies self-locking Elastic Stop Nuts. With the regular fiber locking insert they meet AN-N-5 re-usability requirements. With the new nylon locking insert they surpass these specifications — provide more than 200 re-use cycles.

HOLDS FIRM

. . . against vibration. The Red Elastic Collar—an integral part of the nut—grips bolt threads, because its inside diameter is smaller than bolt diameter. Permits accurate bolt loading — maintains accurate adjustments.



APPROVED SELF-LOCKING FASTENERS

FOR ARMY AND NAVY AIRCRAFT, ORDNANCE AND SIGNAL CORPS EQUIPMENT

Free AN-ESNA Conversion Chart

Elastic Stop Nut Corporation of America
2330 Vauxhall Road
Union, New Jersey

Please send me, free, bulletin detailing the ESNA fastener line and a useful copy of the AN-ESNA Conversion Chart

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ESnail

ESNA TRADE MARK

ELASTIC STOP NUTS

Simplified Valving and Electrical Controls

All valves are mounted on a single manifold to simplify piping and maintenance—as J.I.C. suggests. Electrical controls also meet J.I.C. recommendations.

Floor Space Saved

By mounting the power unit and reservoir at the top of press, valuable floor space was saved... yet the entire unit is readily accessible for maintenance.

Hannifin press

Solves Customer's Problem

Stroke.....24"
Daylight.....40"
Table Width.....60"
(between columns)
Table Depth.....48"
Approach....67"/min.
Feed.....11"/min.
Return.....114"/min.

Versatile, Movable Operating Controls

Exclusive Hannifin Sensitive Pressure Control for hand or foot operation—so arranged that the operating levers can be positioned anywhere along front of press, depending upon nature of work.

Basically this is a standard 150-ton, 4-column Straightening Press... yet it is an example of modifications available at Hannifin to meet customer needs.

For example: Because his floor space was limited, the hydraulic power unit is mounted on top of the press. The table top is "tailored" to the 24-inch height of other units in his production line. The control levers, for hand or foot operation, are movable across the entire front of the press. Both hydraulic and electrical specifications meet J. I. C. recommendations.

Quite probably you can select the hydraulic press you need directly from the complete Hannifin Catalog that includes more than 75 standard models in 1 to 150-ton capacities... but, if your requirements are special, a Hannifin Field Engineer will help you specify a press that will exactly solve your problem.

Hannifin Corporation, 1124 South Kilbourn Avenue, Chicago 24, Illinois

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WRITE FOR BULLETIN 130

HANNIFIN CORPORATION
1124 S. Kilbourn Ave., Chicago 24, Illinois

Please send Bulletin 130 on Hannifin Hydraulic Presses.

Name.....

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MASSIVE NEW SIMMONS PIT LATHE

performs above specifications

FOR LUKENS STEEL

MACHINES 14-FOOT-DIAMETER ALLOY STEEL DRYER ROLLS

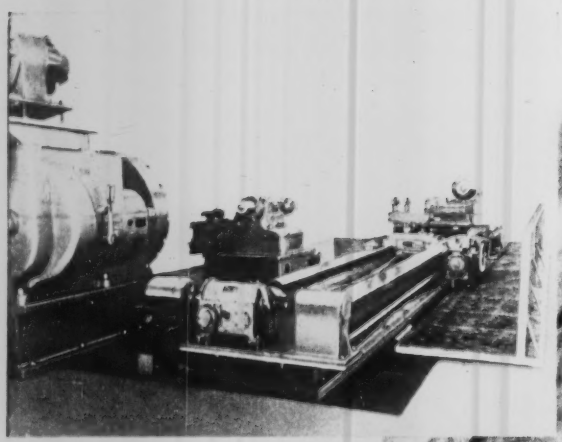
Simmons engineers designed and built this unusual lathe to meet Lukens Steel Company's problems in machining the outer surfaces of their Steam Jacketed Dryer Rolls.

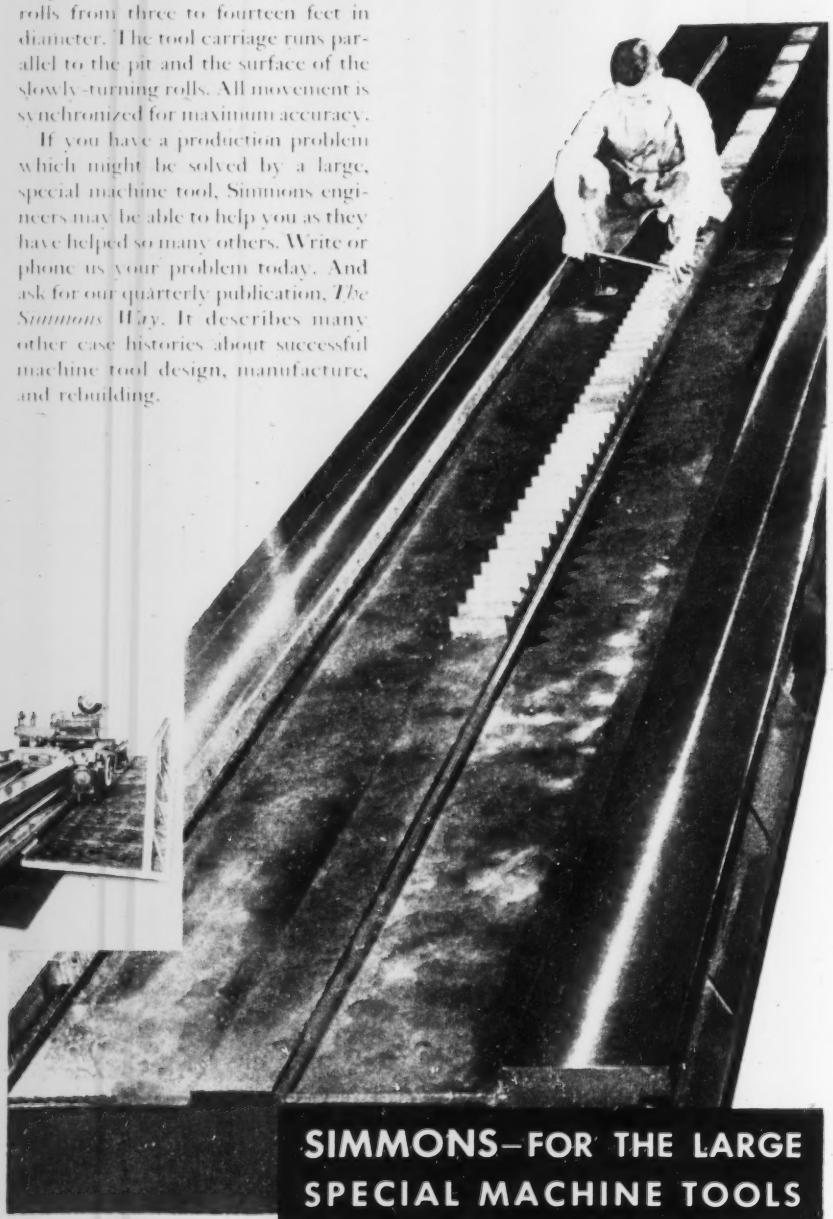
These unwieldy rolls, which run as large as 14 feet in diameter with 30-foot centers, had to be precision machined to a smooth, highly-polished finish. Any irregularities would result in poor heat transfer.

RESULT: *Lukens engineers report that this pit lathe is performing above the specifications that they originally set.*

Turning and grinding carriages on the lathe are motor-driven over the length of a 42-foot bed and can work rolls from three to fourteen feet in diameter. The tool carriage runs parallel to the pit and the surface of the slowly-turning rolls. All movement is synchronized for maximum accuracy.

If you have a production problem which might be solved by a large, special machine tool, Simmons engineers may be able to help you as they have helped so many others. Write or phone us your problem today. And ask for our quarterly publication, *The Simmons Way*. It describes many other case histories about successful machine tool design, manufacture, and rebuilding.





End-on view of *Lukens Pit Lathe shows pit needed for free clearance of large diameter rolls. Carriage travels length of pit.* **At Right:** *42 foot, 17-ton bed of the lathe; ways were finish-ground to 0.002 in.*

SIMMONS—FOR THE LARGE SPECIAL MACHINE TOOLS THAT OTHERS SELDOM BUILD

SIMMONS MACHINE TOOL CORPORATION, 1755 North Broadway, Albany 1, New York

New York Office: 50 East 42nd Street, New York 17, New York

In Philadelphia, phone: Victor 8-3133 In Pittsburgh, phone: Penhurst 1-3700

A Fast Start!

Pictured above are some of the Allis-Chalmers control installations at Granite City Steel.

Left — *Regulex* amplifier exciter sets provide sensitive control for variable voltage dc drives.

Center — Constant voltage control panels for dc auxiliary drives.

Right — Liquid rheostat provides stepless speed control for 7000-hp m-g set.

Regulex is an Allis-Chalmers trademark.

NEW GRANITE CITY "BLOOMER" GOES INTO PRODUCTION WITHOUT SHAKEDOWN

All control for main and dc auxiliary drives in the new blooming mill at Granite City Steel was supplied by Allis-Chalmers. Significantly, near capacity production started immediately . . . without a costly shakedown. In fact, eight days later the old mill was taken out since it was apparent that standby equipment was not needed.

Noteworthy, too, is the fact that the installation was completed *on time*. Controls were factory assembled, thus simplifying and speeding installation.

Progressive Granite City Steel has standardized on Allis-Chalmers electrical equipment in its large expansion program. The recently completed blooming mill is the first stage in a three-stage plan. When completed, this realistic, farsighted expansion will push production to well over a million ingot tons annually.

Why not put Allis-Chalmers skill and experience to work for you? Call your nearby A-C steel mill representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

A 4114

ALLIS-CHALMERS

FOR INDUCTION HEATING— SPECIFY WESTINGHOUSE

Leader for Years in Total KW in Use—Years of experience gained by Westinghouse from hundreds of induction heating installations throughout industry can be applied now to your own heat-treating needs. You are assured of reliability—proved by the fact that the total kilowatt-hours generated by installed Westinghouse induction heating equipment has exceeded, year in year out, that of any other manufacturer.

And you know that Westinghouse, as a manufacturer of both motor-generator and radio-frequency-generator induction heating units, is in a position to recommend equipment without bias for your specific requirements. Whatever your heat-treating problem, inquire about these efficient, versatile tools now. Call your Westinghouse representative or write: Westinghouse Electric Corporation, Electronics Division, Induction Heating Section, 2519 Wilkens Avenue, Baltimore 3, Maryland.

**Higher ratings can be supplied for any specific purpose.*

YOU CAN BE SURE...IF IT'S

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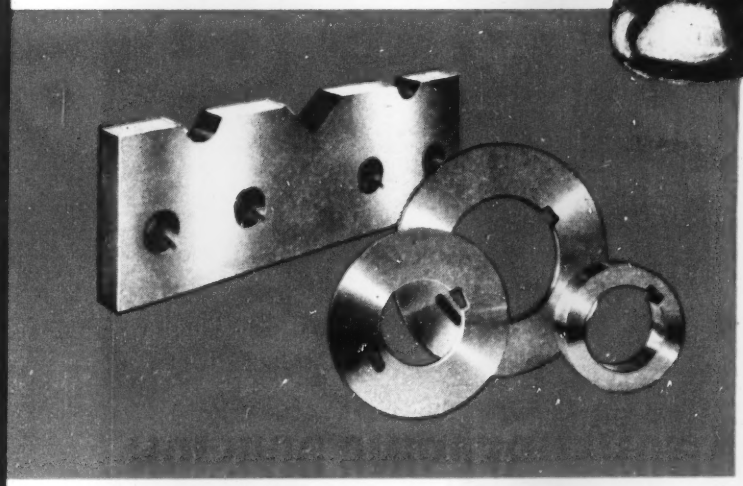
built for
rugged action

Heppenstall
SHEAR KNIVES
durable blades for industry



Many leading plants make Heppenstall their standard specification for shear knives. Heppenstall's record for durability provides such production advantages as:

- MORE CUTS BETWEEN GRINDS
- MORE UNITS PER BLADE
- LOWER OVERALL BLADE COST
- INCREASES IN PRODUCTION

The reasons may be found in Heppenstall's high standards for the development and manufacture of shear knives. Made from high quality, electric induction steels, these long-lasting knives are famous wherever hot and cold, ferrous and non-ferrous metals are cut and sheared.

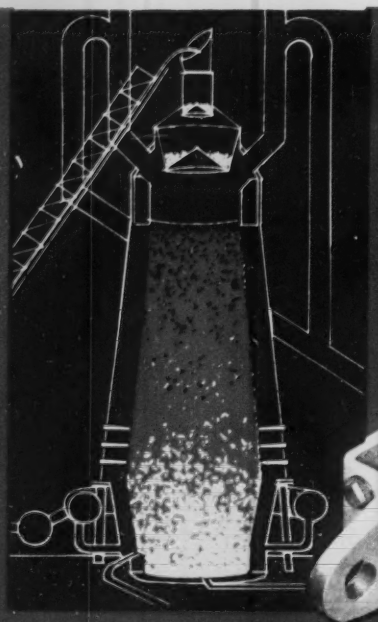
Make Heppenstall *your* standard specifications.

Heppenstall

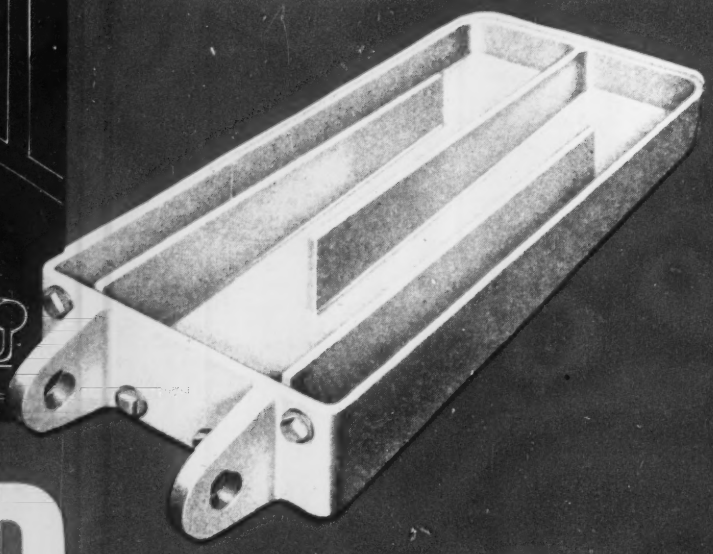
The most dependable name in forgings

PITTSBURGH 1, PENNSYLVANIA

Sales offices in principal cities



for greater heat resistance, specify



NBD

vertical-baffle bosh plates

they are tougher, longer lived, more economical

N B D Vertical-Baffle Bosh Plates give you these advantages:

1. Greater ease in back flushing.
2. Positive, visual inspection of the interior.
3. Increased brick load-carrying capacity.

By means of cored holes in the verticle baffles, all entrapped air is expelled through the unusually high outlet. The rectangular design eliminates the need for cutting special brick shapes. These advantages, plus greater resistance to heat, are the result of over 30 years' experience in producing quality copper castings. The combination of correct design and controlled foundry techniques backed by extensive research facilities enables National Bearing to deliver this and other products that will keep your furnaces going full blast.

Other N B D products for the steel industry—

monkeys
tuyere coolers
coolers
mantle plates
tuyeres
valves
stack plates
valve seats

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

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Plants in: St. Louis, Mo., Meadville, Pa., Niles, Ohio, Portsmouth, Va., St. Paul, Minn., Chicago, Ill.

Lower production costs with YALE ELECTRIC TRUCKS

...and the YALE attachments designed for your industry

Crate clamp attachment also available with sideshifter.

Pusher attachment for automatic positioning of loads.

Paper roll clamp attachment rotates through a full 360°.

The rugged structure of every YALE Electric Truck is designed to house the most efficient power plant available...to insure more than ample capacity for your particular lifting, moving and stacking jobs. The trouble-free YALE hydraulic system provides sure, steady power for safer, smoother lifting and lowering. Yet, with all these advantages...with power and stamina to spare...YALE Electric Trucks are economical to own, operate and maintain...amazingly versatile for every materials handling problem.

YALE*

MATERIALS HANDLING EQUIPMENT

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☐ Please send me the *Picture Story of Yale Materials Handling Equipment*

☐ Please have local YALE Representative call

Company_____

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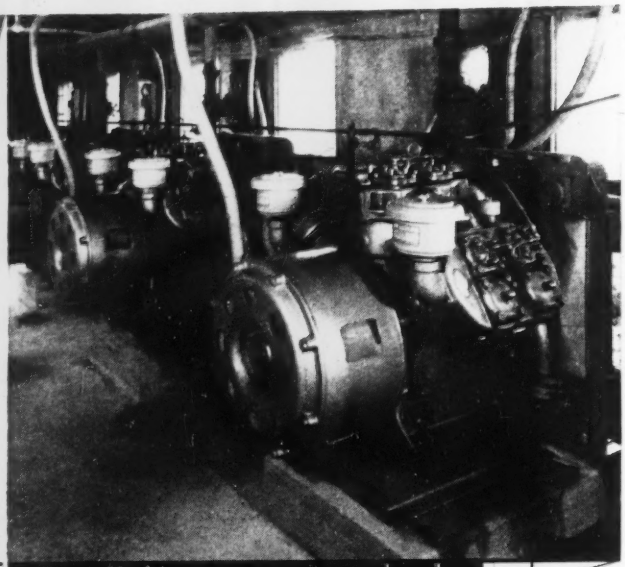
In Canada write The Yale & Towne Manufacturing Company St. Catharines, Ontario, Canada

Gas, Electric, Diesel & LP-Gas Industrial Trucks • Worksavers • Hand Trucks • Hand & Electric Hoists • Pul-Lifts

listen...

to shop talk

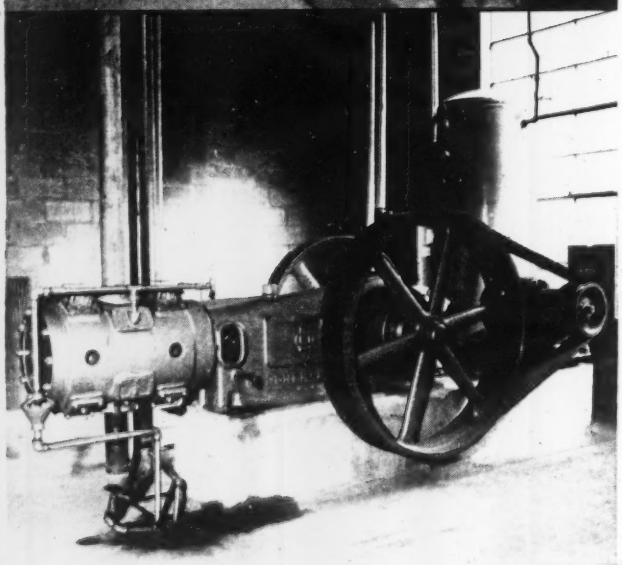
"We bought our first Gardner-Denver WB Compressor in 1939, and liked it so well we have installed six more WB machines over the past 14 years."
—a Pennsylvania Co.



read...

maintenance reports

"We've operated our RX unit 16 to 20 hours per day for seven years with no special attention—not even the replacement of a valve disk."
—a corporation in Tennessee



write...

for complete information

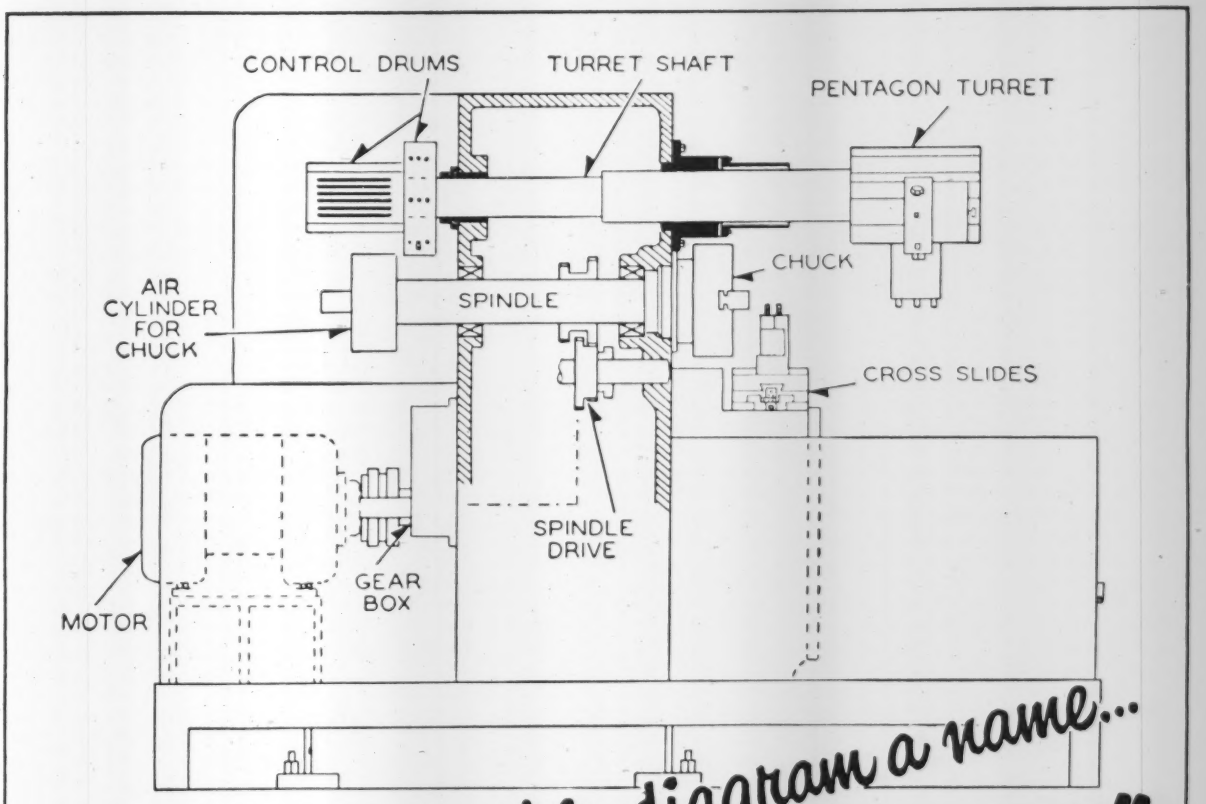
Bulletin WB-10 tells all about the two-stage WB.
Bulletin HAC-40 describes the single-stage RX.

SINCE 1859

GARDNER-DENVER

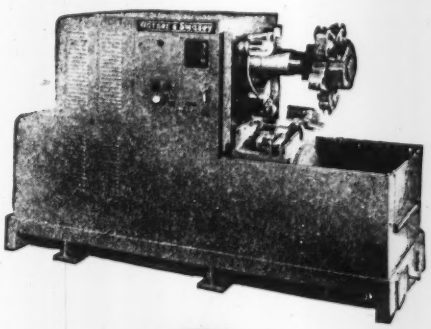
Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd.,
14 Curity Avenue, Toronto 13, Ontario

THE QUALITY LEADER IN COMPRESSORS, PUMPS AND ROCK DRILLS
FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY



We've given this diagram a name...

"SIMPLICITY!"



WARNER & SWASEY
Cleveland
PRECISION MACHINERY SINCE 1880

WE'VE LABELED IT "simplicity" because the machine it represents *is* so simple. Engineered simplicity is designed into the Warner & Swasey 1 AC Single Spindle Automatic Chucking Machine.

The 1 AC is simple and easy to set up . . . simple to tool, and simple to operate. There are no cams to change, and tooling stations are easy to get at. A wide range of speeds and feeds are readily available.

You get accurate, automatic machine operation on even small lot jobs that were never practical for automatic machines before.

Certain machining jobs in your plant—even in small or medium lot runs—can undoubtedly be done faster, and with less manpower, with the 1 AC Automatic. To find out how this 1 AC fits into your production picture, call our Field Representative in your territory.

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

Koppers

designs and constructs electric furnace melting shops

MODERN electric furnace melt shops are designed and constructed by our Freyn Department to meet the most exacting specifications.

You may be interested in investigating the possibilities of a "turnkey" electric furnace plant . . . one that is designed and built for the maximum economy of efficient handling and easy flow of materials.

We will be pleased to work up preliminary plans and estimates based on your particular requirements . . . without obligation, of course.

Constructing electric furnace melt shops is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers. You are invited to consult with our Engineers and Management.

KOPPERS®

Engineering and Construction Division

KOPPERS COMPANY, INC. · PITTSBURGH 19, PENNSYLVANIA

Announcing

NICKEL-LUME

A NEW BRIGHT NICKEL PROCESS BY HANSON-VAN WINKLE-MUNNING COMPANY

H-VW-M takes great pleasure in presenting Nickel-Lume, a superior new bright-nickel electroplating process. Nickel-Lume addition agents are of the organic type, yet have none of the inherent faults and limitations of previous organic agents. A result of several years of careful research and development, Nickel-Lume has been subjected to stringent field tests both in job shops, with a wide variety of work and plating problems, as well as in large plant production using full-automatic equipment. In every test, Nickel-Lume has shown excellent results, a *really bright finish directly from the plating bath* with all these marked advantages:

OUTSTANDING BRIGHTNESS – full, bright deposits over a wide range of operating conditions. Relatively thin deposits, too, are *really bright;* lustre builds as thickness increases. Even intricate, deeply-recessed articles have uniform brightness without shading.

LOW INTERNAL STRESS – stress can be controlled to a low value on either the compressive or tensile side and *held* within satisfactory limits as the solution ages–no cracking, crazing, lifting, or brittleness of deposits.

HIGH DUCTILITY – comparative nickel tests show surprising ductility–even after continued bath use in production.

GOOD LEVELING – in normal deposits surface roughness is reduced 50% more. Costly polishing and buffing can be substantially reduced.

WIDE CURRENT DENSITY RANGE – without noticeable change in brightness, current density can vary from below 5 to above 70 asf. Plating speeds can change to meet various production schedules and specifications.

WIDE SOLUTION TEMPERATURE RANGE – baths may be operated at room temperature with full deposit brightness up to and beyond 140°F. With moderate to high current densities, a temperature above 120°F. is seldom required.

GOOD STABILITY – no breakdown of addition agent, therefore no cloudy, brittle, or highly-stressed deposits. No time-consuming, costly "stripping" operations.

HIGH TOLERANCE TO IMPURITIES – no bath "upset" by a few milligrams of metallic or organic impurities. As a rule, organics are tolerated in greater concentrations than in other bright baths.

SUPERIOR THROWING POWER – equal to or better than other commercial processes. Deposits–even in recessed areas–have uniform brightness without shading.

GOOD CORROSION PROTECTION QUALITIES – addition agent nature plus constant deposit characteristics give a high level of protection to the plated surface.

SIMPLE CONTROL – all constituents, including addition agents, can be determined and controlled by chemical analysis, thus maintaining deposits at constant and optimum characteristics.

PLEASING WHITE COLOR – approaching well-known cobalt-nickel deposits in whiteness of color–not the unappealing, yellow cast usually associated with organic addition agents.

NO OBJECTIONABLE FUMES – *ventilation is not required* – bath temperature is low, and no obnoxious or dangerous fumes are given off.

HIGH DEPOSIT ACTIVITY – deposit surfaces are exceedingly active and accept chromium or other deposits without activating treatment. In some installations, work with defective surfaces goes right back through normal plating cycle without blistering of nickel-on-nickel.

LOW INSTALLATION COSTS – all that is needed is equipment for a Watts nickel bath. Filtration can be periodic or continuous. No ventilation is required. Heat demands are low. Existing auxiliary equipment can be used.

LOW OPERATING COSTS – initial cost comparable to other bright nickel baths *but*, cost of brightener replenishment is much lower. Control is simple. No frequent pumping out and bath treatment. No production loss through sudden failure of bath to perform satisfactorily. Regular non-premium anodes are used.

Complete details and instruction manual will be forwarded on request.

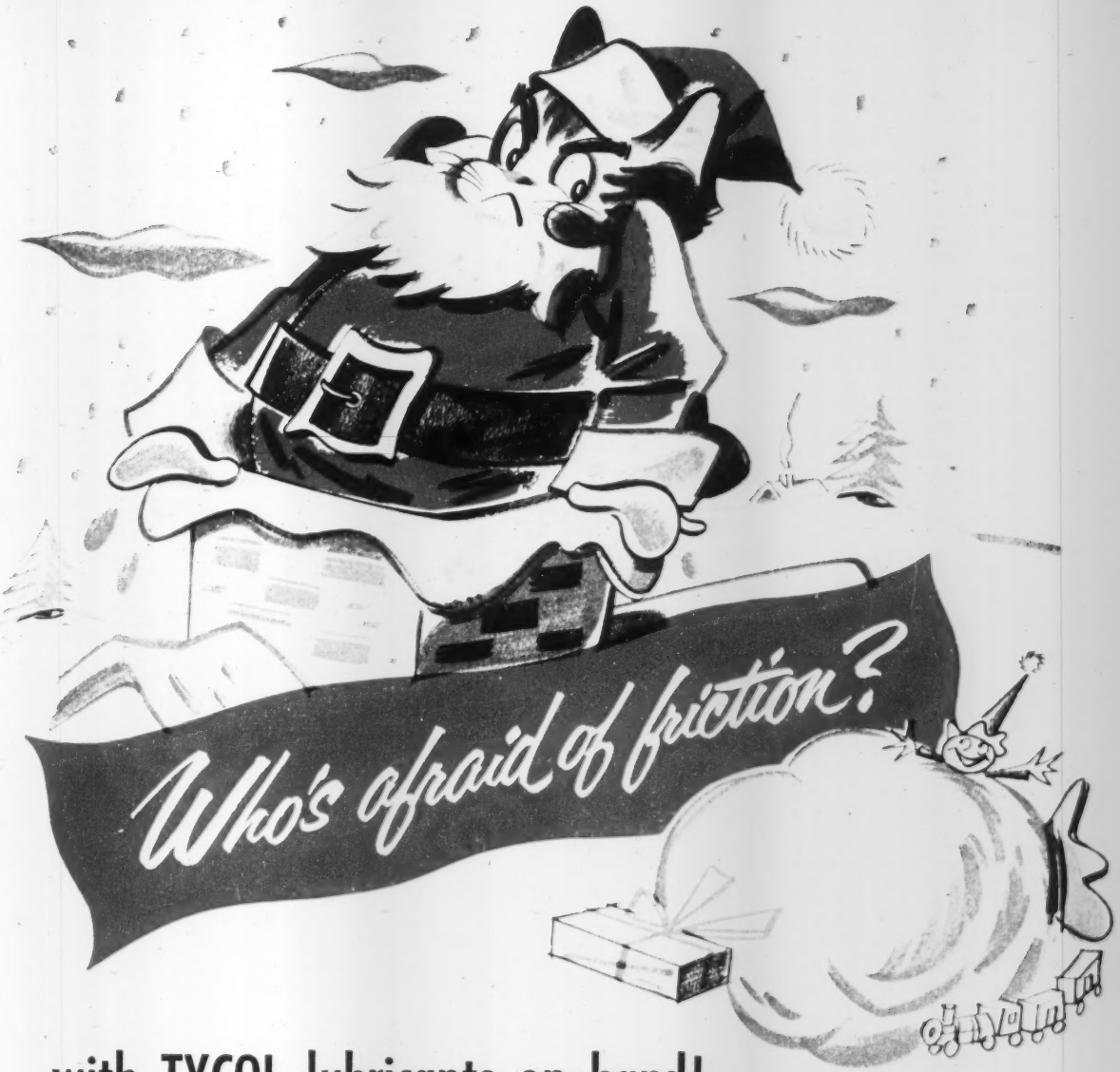
Your H-VW-M combination–of the most modern testing and developing laboratory–of over 80 years experience in every phase of plating and polishing–of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING CO., MATAWAN, N. J.

PLANTS AT MATAWAN, N. J. • ANDERSON, INDIANA
SALES OFFICES: ANDERSON • BALTIMORE • BOSTON CHICAGO • CLEVELAND • DAYTON • DETROIT • GRAND RAPIDS • LOS ANGELES • LOUISVILLE • MATAWAN MILWAUKEE • NEW YORK • PHILADELPHIA • PITTSBURGH ROCHESTER • SPRINGFIELD (MASS.) • STRATFORD (CONN.) UTICA • WALLINGFORD (CONN.)

H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES



...with TYCOL lubricants on hand!

The "All-Weather" Bearing Lubricant! Steel mills have shown a lively interest in Tycol Acylkup 4, a year 'round bearing grease that does a variety of jobs with a complete disregard for thermometer readings. Although all methods of application are suitable, one "3-Furnace" mill has found it particularly adaptable for use in its automatic grease systems — with complete ease of pumping even in the coldest weather. From Blast furnaces: Sheave Bearings, Bell Mechanism, Skip Hoists, etc. . . . to Coal and Ore Bridges, Tycol Acylkup 4 is a natural for lubricating yard equipment in every steel mill. With two big savings: "all weather" protection . . . and lowered maintenance costs on automatic pressure systems. For details, contact your local Tide Water Associated office!

TYCOL
INDUSTRIAL LUBRICANTS

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Over 300 Tycol industrial lubricants are at your disposal . . . engineered to fit the job!

TIDE WATER ASSOCIATED OIL COMPANY
17 BATTERY PLACE · NEW YORK 4, N.Y.

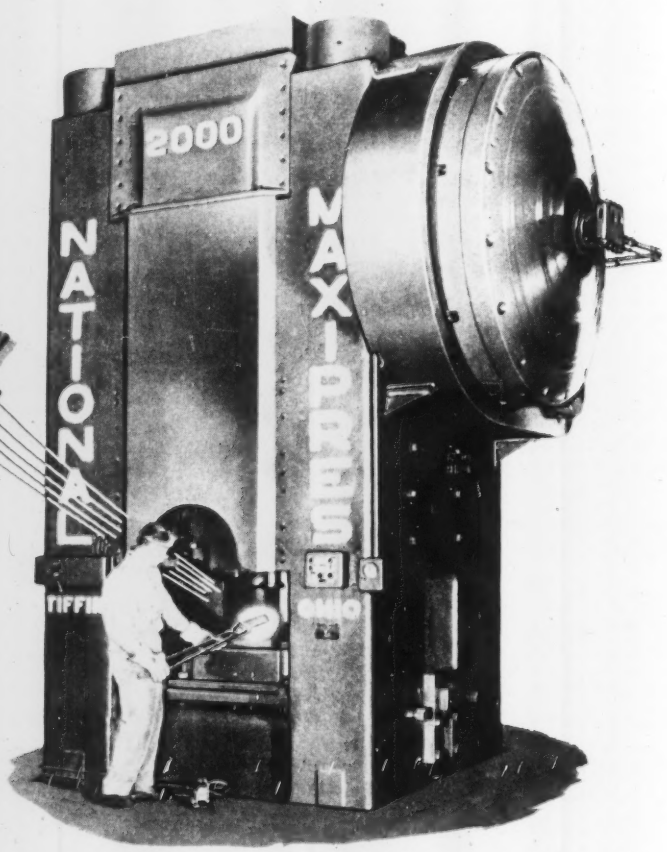
REFINERS AND MARKETERS OF VEEDOL . . . THE WORLD'S MOST FAMOUS MOTOR OIL

JET PARTS PRECISION-FORGED ON *MAXIPRESSES!*

● The forging of compressor blades and turbine buckets for jet aircraft engines demands the unparalleled ruggedness designed and built into the *new* MAXIPRES.

For this reason MAXIPRESSES are being chosen for the vast portion of the American, Canadian and British jet forging installations.

These fine, newly redesigned, high speed forging presses, embodying 23 new features, are specially suited to the most difficult present-day work, and by the same token will be the most reliable forge-shop equipment for future use as well.



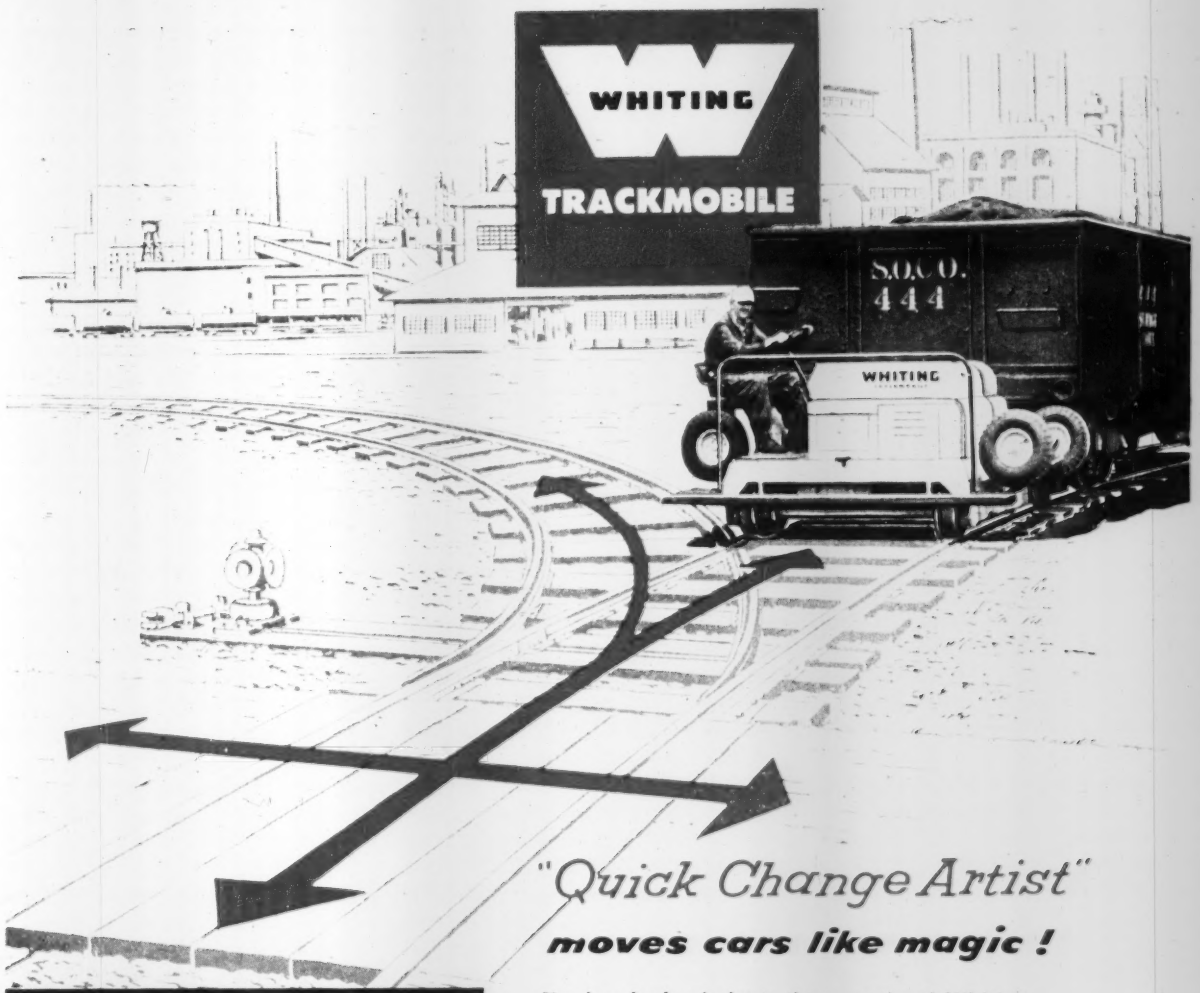
NATIONAL
MACHINERY COMPANY
TIFFIN, OHIO — SINCE 1874

DESIGNERS AND BUILDERS OF MODERN FORGING MACHINES • MAXIPRESSES • REDUCEROLLS • COLD HEADERS • BOLTMAKERS • NUT FORMERS • TAPPERS • NAILMAKERS

Hartford Detroit Chicago

WHITING

TRACKMOBILE



"Quick Change Artist"

moves cars like magic!

For hundreds of plants the sensational Whiting Trackmobile has revolutionized freight car handling. Traffic men claim it is far more efficient than the ordinary switch engine because it travels on track or road and can't be "bottled up." It handles a variety of jobs on different tracks in a matter of minutes. The Trackmobile is low in original cost, low in operating cost. It speeds up freight car movement—reduces demurrage—increases production!

Write today for "Reports From The Field"—a booklet containing practical information for simplifying freight car handling.

The Trackmobile goes right to the job on its road wheels—changes to track wheels in 30 seconds. It's now ready to switch, spot or haul.

WHITING CORPORATION

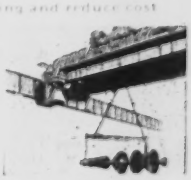
15643 Lathrop Avenue, Harvey, Illinois

Sales Offices and Distributors throughout the world.

Other Whiting products that speed handling and reduce cost

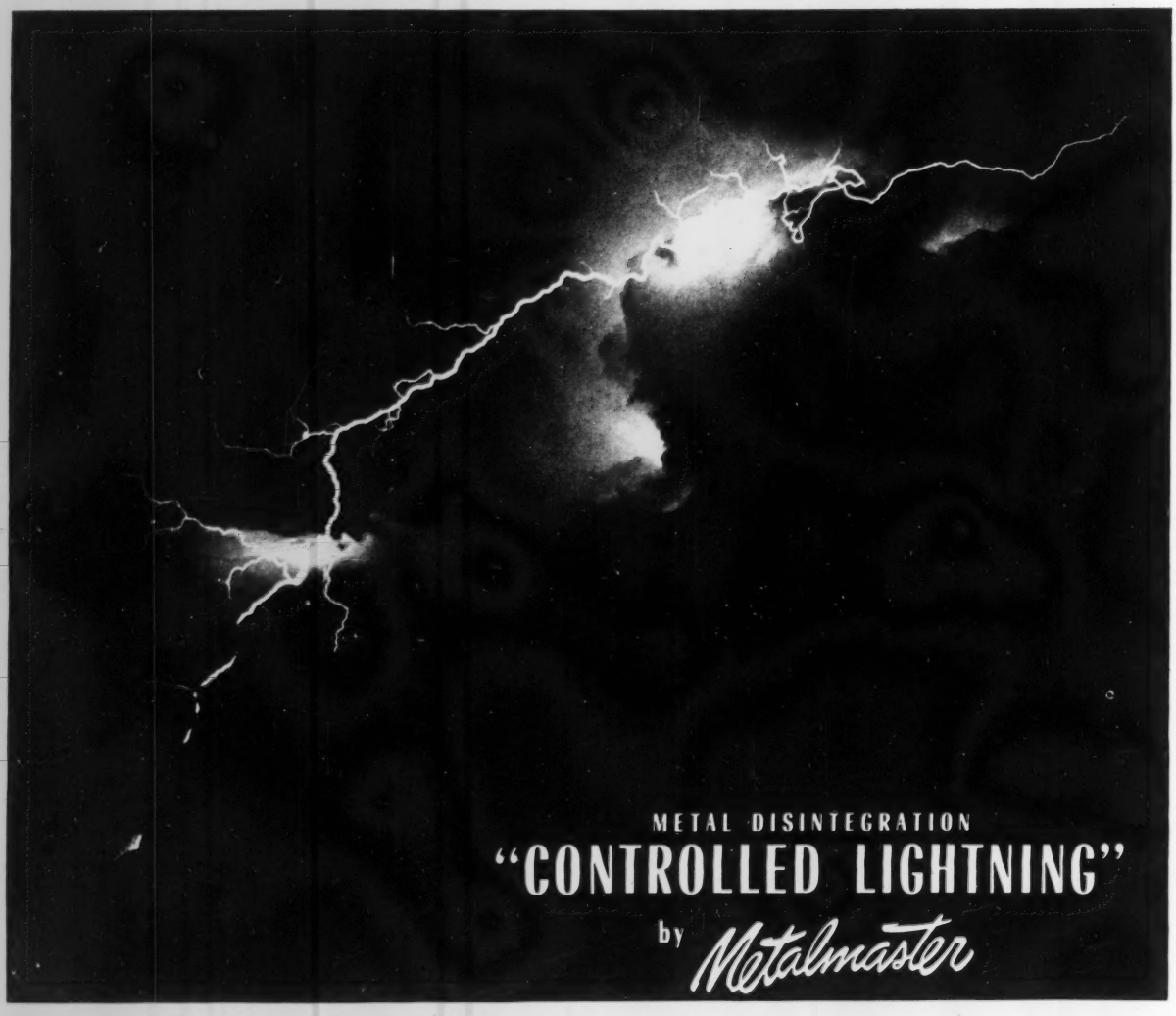
Trambeam Overhead Handling Systems

Electric Chain Hoists



Electric Traveling Cranes

Whiting Corporation also manufactures Railroad and Aviation Equipment, Swenson Chemical Processing Equipment and Metal Working Machinery.



By the use of high electrical voltage Metalmaster has given its user the power and speed to cut the hardest metals man has been able to produce . . . This we call DISINTEGRATION for it actually disintegrates the metal without affecting the hardness.

Metalmaster Disintegrators save thousands of dollars each month for their users through the salvage of workpieces normally going into scrap.

One firm alone through the use of two Metalmasters saves annually over $70,000.00 in just tool and die repair alone.

IMAGINE, for a moment, the potential . . . if you could cut ANY shape hole, ANY size in ANY hardened metal!

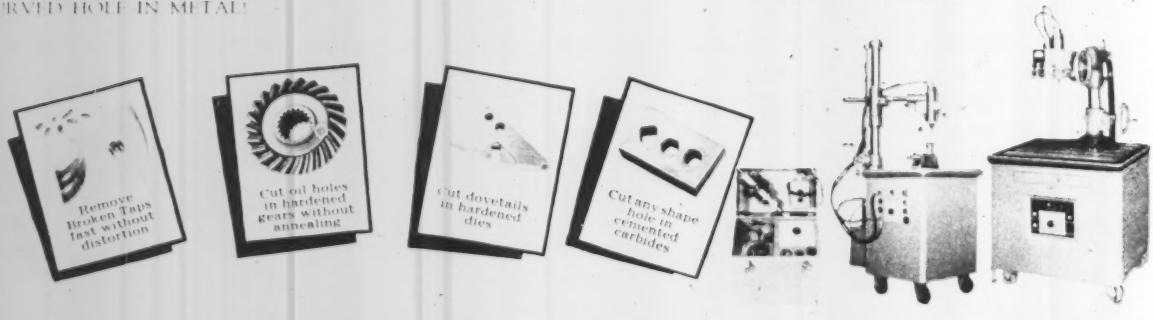
IMAGINE, for a moment, the potential . . . if you could cut a CURVED HOLE IN METAL!

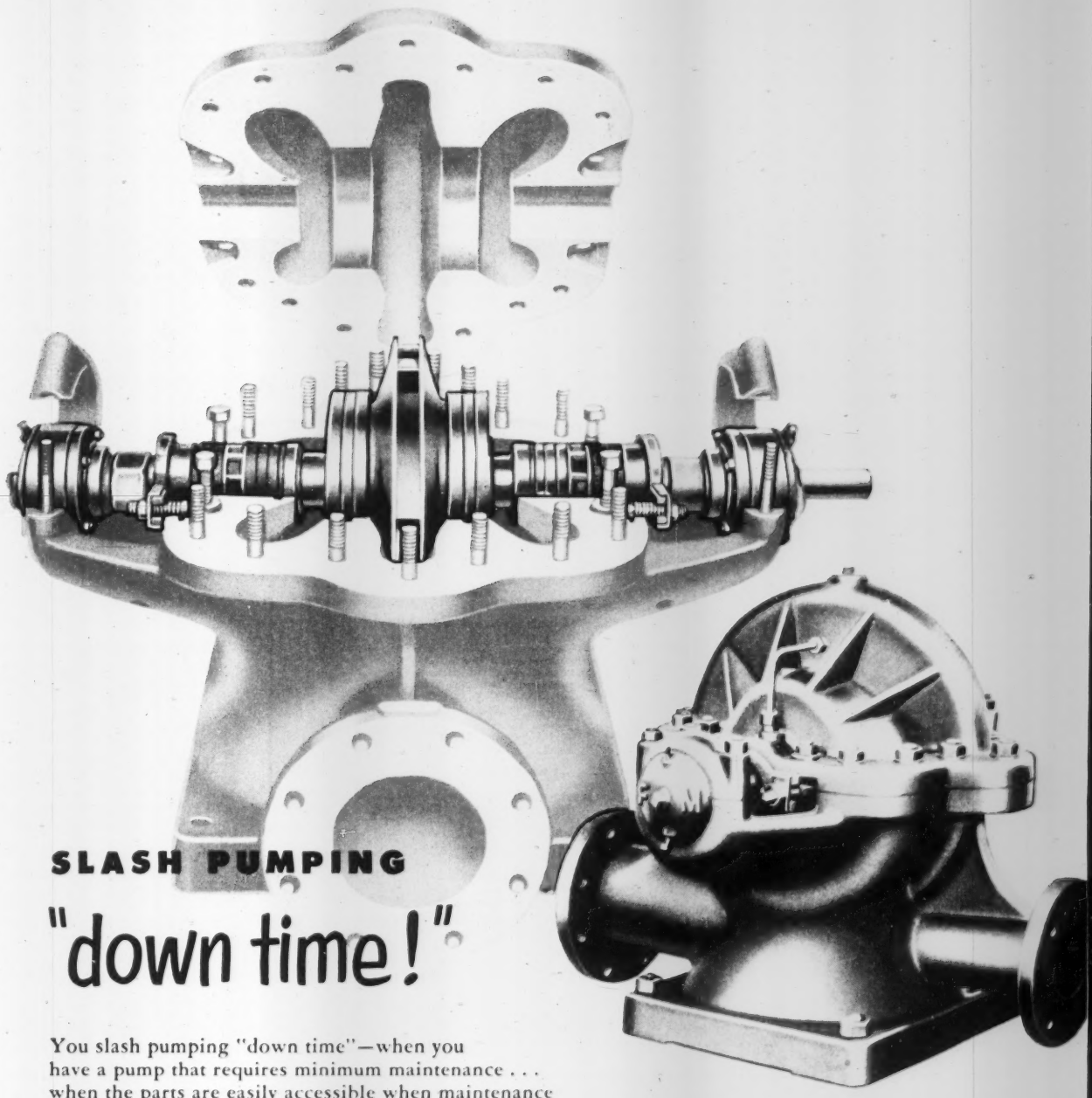
IMAGINE, for a moment, the potential . . . if you could save that enormous scrap pile of workpieces with broken taps, drills, reamers, etc. You can do it with Metalmaster . . . in a matter of minutes per part.

IMAGINE, for a moment, the potential . . . of a machine that in many cases saves its initial cost in just one free demonstration in a customer's plant. This is a common occurrence with Metalmaster.

For information relative to the many machines available for your type operation and the many advantages Metalmaster can offer your firm, write today on your company letterhead to:

METALMASTER DIVISION
CLINTON MACHINE COMPANY
CLINTON, MICHIGAN





SLASH PUMPING "down time!"

You slash pumping "down time"—when you have a pump that requires minimum maintenance . . . when the parts are easily accessible when maintenance is necessary . . . when you have a Fairbanks-Morse Split-Case Centrifugal Pump!

See how easily this sturdy pump is inspected . . . lift the split casing and the entire rotating element can be removed without disturbing driver or pipe connections . . . even the bearings can be removed without use of a bearing puller!

See your Fairbanks-Morse Branch Pump Engineer on this Split-Case Single-Stage Centrifugal and the rest of his complete pump line. Fairbanks, Morse & Co., Chicago 5, Illinois.

FAIRBANKS-MORSE

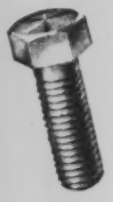
a name worth remembering when you want the best

PUMPS • SCALES • DIESEL LOCOMOTIVES AND ENGINES • ELECTRICAL MACHINERY
RAIL CARS • HOME WATER SERVICE EQUIPMENT • FARM MACHINERY • MAGNETOS

STANDARDS and SPECIALS by the Millions

THE FERRY CAP & SET SCREW CO.

2159 SCRANTON ROAD • • • CLEVELAND 13, OHIO



"SHINYHEADS"

America's Best Looking Cap Screw

Made of high carbon steel — AISI C-1038 — to standards for Full Finished hexagon head cap screws — bright finish. Heads machined top and bottom. Hexagon faces clean cut, smooth and true, mirror finish. Tensile strength 95,000-110,000 p.s.i. Carried in stock.

"HI-CARBS"

Heat Treated Black Satin Finish

Made of high carbon steel — AISI C-1038. Furnished with black satin finish due to double heat treatment. Hexagon heads die made, not machined. Points machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

"LO-CARBS"

Made of AISI C-1018 steel — bright finish. For use where heat treatment is not required and where ordinary hexagon heads are satisfactory. Hexagon heads die made to size — not machined. Points machine turned. Tensile strength 75,000-95,000 p.s.i. Carried in stock.

SET SCREWS

Square head and headless — cup point. Case hardened. Expertly made by the pioneers in producing Cup Point Set Screws by the cold upset process. Cup points machine turned. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots — less burrs. Flat and chamfered machined point. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered machined point. Nut end, oval point. Land between threads shiny, bright, mirror finish. Carried in stock.

ADJUSTING SCREWS

Valve tappet adjusting screws — Hexagon head style — to blue print specifications — hexagon head hard, polished if specified — threads soft to close tolerance — points machine turned, flat and chamfered.

CONNECTING ROD BOLTS

Made of alloy steel — heat treated — threads rolled or cut — finished to extremely close thread and body tolerances — body ground where specified. Expertly made by the pioneers in producing connecting rod bolts by the cold upset process.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

FERRY PATENTED ACORN NUTS

For ornamental purposes. Steel insert — steel covered. Finish: plain, zinc plated, cadmium plated. Size: 9/16", 3/4", 15/16" across the flats. Tapped 1/4" to 3/4" inclusive. Cross section of Ferry patented acorn nut, showing how steel hexagon nut fits snugly into shell.

Pioneers and Recognized Specialists, Cold Upset Screw Products since 1907

STANDARDS carried by LEADING DISTRIBUTORS

SPECIALS furnished to BLUE PRINT SPECIFICATIONS

WRITE FOR INFORMATION

SEND FOR SAMPLES

Durasheath: all-purpose power cable

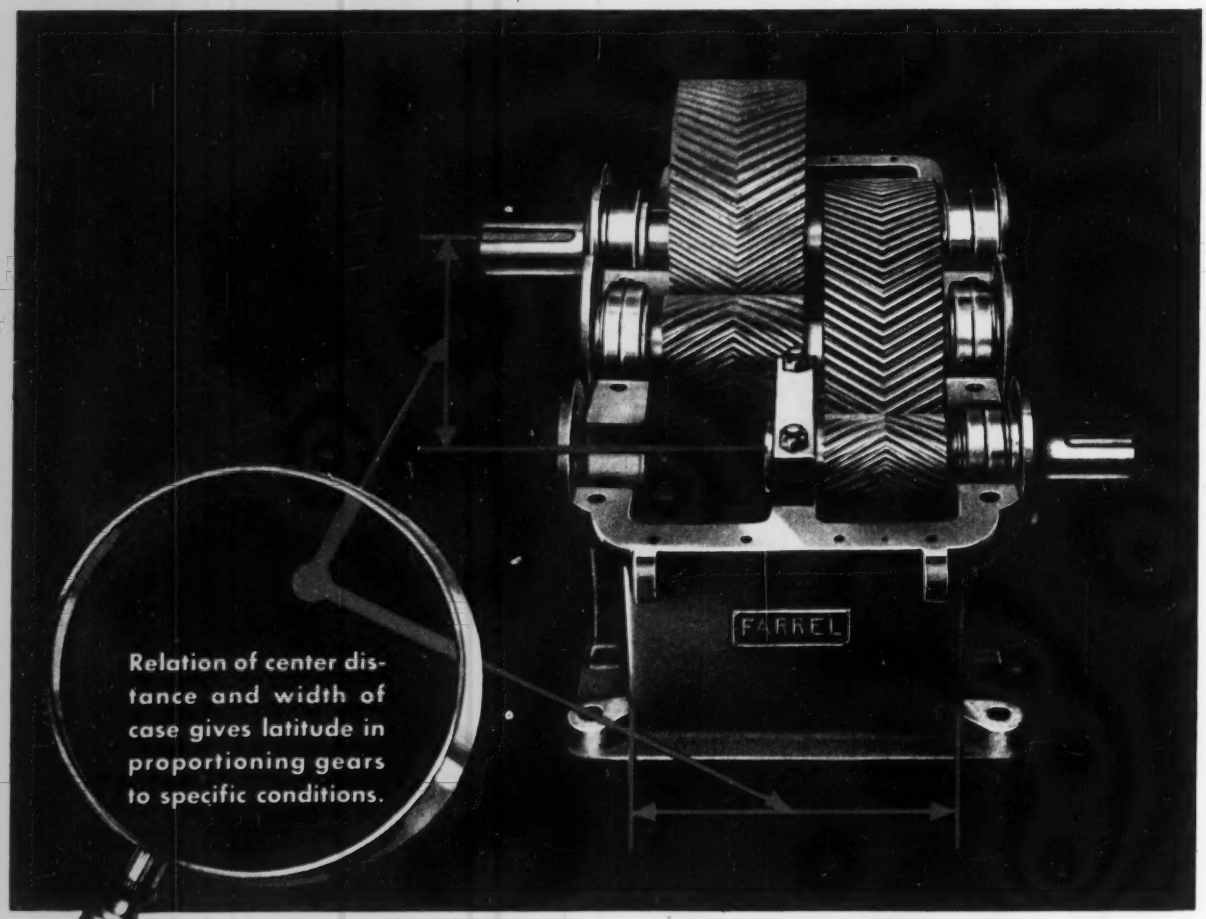
In heavily industrialized areas, utilities can cut their installation and maintenance costs with light, tough DURASHEATH*. This flexible, easily handled cable may be run buried in the earth, in ducts or overhead (or in any combination) without needless, time-consuming jointing. Its light weight and flexibility make duct-pulling fast even in zero weather. Aerial assemblies go faster. Linemen like to work with it. And you need stock only one cable type.

As one of several types of ANACONDA power cables, DURASHEATH is available in all sizes, single or multiconductor, copper or aluminum, from 600 to 15,000 volts. It is thoroughly dependable for industrial plants, railroads, series or multiple street lighting, traffic control, and airport† lighting, residential primaries and secondaries, as well as for such uses as Type USE cable for underground service entrance. *Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.*

ANACONDA

Primary and secondary distribution cables • building, machine tool, control and communication wire • portable cords and cables • bus-drop cables • apparatus cables • copper, aluminum, copper-weld conductors • wire and cable accessories

†when ordered to CAA Specifications L-824



Take a closer look at why Farrel® speed reducers can solve your drive problems

Unlike most "standardized" products, Farrel speed reducers are standard only in their principal features. They are adaptable in critical detail.

The gears and pinions can be proportioned to meet specific load, speed and service requirements. Input and output shafts can be varied in size, in material, and in extension. Even some housing dimensions can be modified to meet problems in mounting.

This design flexibility has resulted in the solution of innumerable application problems. There is no need to compromise. You can ask for—and get—a unit that will meet your exact needs.

Then, too, Farrel speed reducers are made in a number of different types, with a wide range of ratios and capacities. Designs include single, double and multiple reduction units, speed change units having two or more selective speeds, right angle drives, and drives to meet special requirements.

Write for further details of these problem-solving units. Ask for a copy of Bulletin 449.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Detroit, Chicago, Memphis, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

Farrel-Birmingham®

FB-813

Each Achieved With the Right REPUBLIC COLD DRAWN ALLOY STEEL BARS

Here are examples of alloy steel parts made by Republic customers. Each was searching for a certain outstanding characteristic . . .

One wanted the edges of a set-screw for a coal-cutter chain to be tough enough to resist rounding off when dragging through a coal seam deep in a mine . . .

The next one wanted an automobile water-pump shaft hard enough to resist thousands of miles of high-speed service without becoming worn and leaky . . .

The third wanted a socket-wrench with a socket that was stronger than the heaviest-handed mechanic . . .

All three manufacturers called in the Republic Field Metallurgist . . . discussed their three different problems with him . . . got a triple-distilled alloy-choice that was part his, part the Republic Mill Metallurgist's, part the Republic Laboratory Metallurgist's.

Each customer is using a different Republic Cold Drawn Alloy Steel Bar grade . . . all three got the high surface quality, the close dimensional tolerance, the high strength, and the UNIFORM MACHINABILITY that helped cut production costs, increase tool life, improve product quality.

Want to try Republic 3-Dimension Metallurgical Service on *your* production problems? A call to your Republic District Sales Office will start action.

REPUBLIC STEEL CORPORATION
Alloy Steel Division • Massillon, Ohio
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, N. Y.

LAB FIELD MILL
3-DIMENSION Metallurgical Service

. . . combines the extensive experience and coordinated abilities of Republic's *Field*, *Mill* and *Laboratory* Metallurgists with the knowledge and skills of your own engineers. It has helped guide users of Alloy Steels in countless industries to the correct steel and its most efficient usage. IT CAN DO THE SAME FOR YOU.

Republic COLD DRAWN
ALLOY STEEL BARS

REPUBLIC STEEL

Is long service life at low cost your problem?

here's how leading tractor manufacturers solve it with NEEDLE BEARINGS

Many makers of farm tractors specify Torrington Needle Bearings because of their relatively low cost and their long maintenance-free operation under rugged conditions.

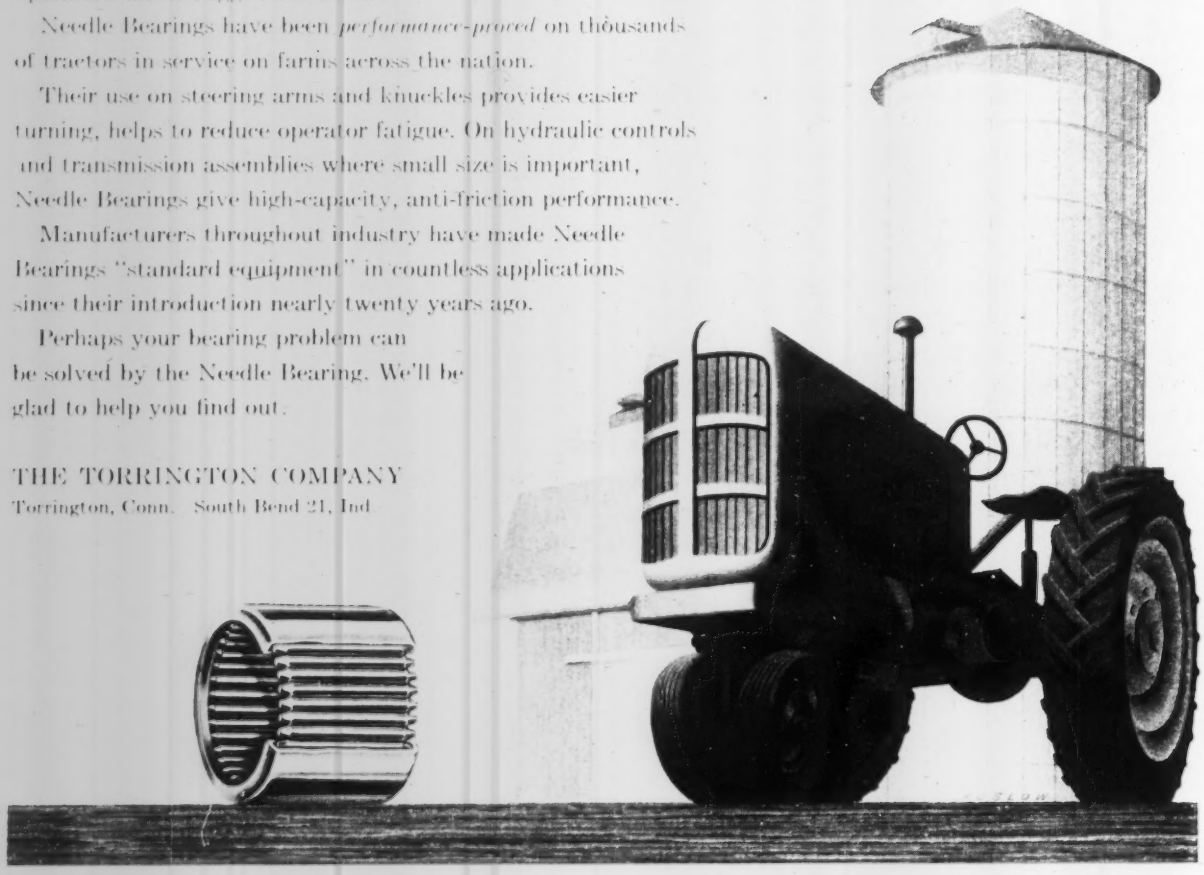
Needle Bearings have been *performance-proved* on thousands of tractors in service on farms across the nation.

Their use on steering arms and knuckles provides easier turning, helps to reduce operator fatigue. On hydraulic controls and transmission assemblies where small size is important, Needle Bearings give high-capacity, anti-friction performance.

Manufacturers throughout industry have made Needle Bearings "standard equipment" in countless applications since their introduction nearly twenty years ago.

Perhaps your bearing problem can be solved by the Needle Bearing. We'll be glad to help you find out.

THE TORRINGTON COMPANY
Torrington, Conn. South Bend 21, Ind.



TORRINGTON NEEDLE BEARINGS

Needle • Spherical Roller • Tapered Roller • Straight Roller • Ball • Needle Rollers

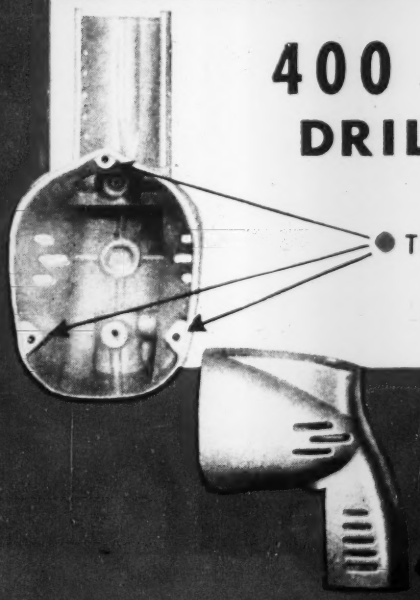
Trade-marks of some of the manufacturers who use Needle Bearings

A-C ALLIS-CHALMERS · JOHN DEERE QUALITY FARM EQUIPMENT · MASSEY-HARRIS M-H · OLIVER · CATERPILLAR · Ferguson · INTERNATIONAL HARVESTER · Ford · MINNEAPOLIS-MOLINE MODERN MACHINERY · CASE

AN A33A NATCO PROVIDES

High Production plus Flexibility

FOR THOSE SMALL PARTS



400 SMALL PARTS DRILLED or TAPPED PER HOUR

THREE .1065 HOLES DRILLED
OR TAPPED 6-32 TAP
IN HAND DRILL HOUSING

JUST ONE OF MANY PARTS drilled and tapped on these NATCO High-Speed adjustable A33A machines

Another example of light sensitive machines

NATCO ENGINEERED

for Quality and Quantity Production

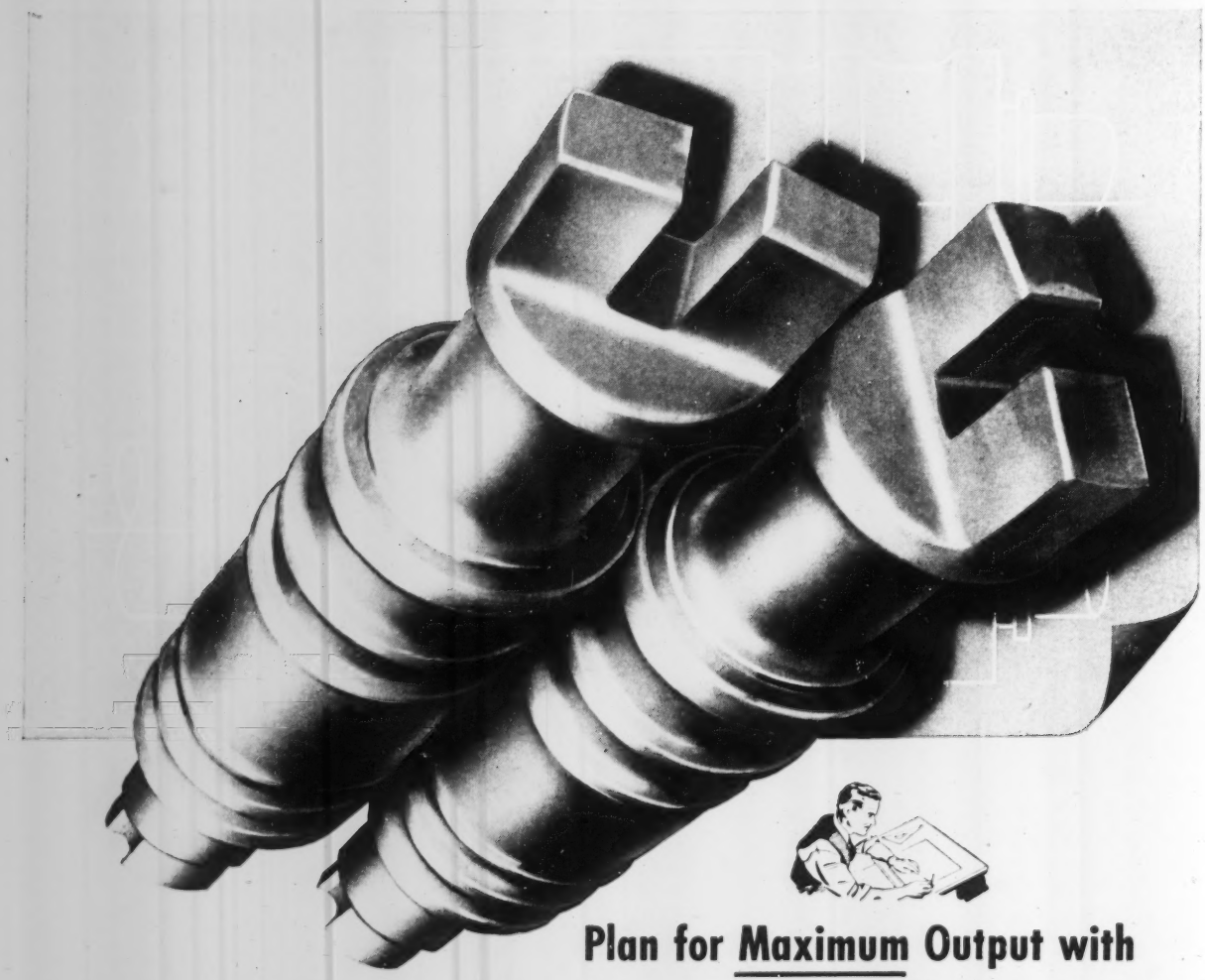
NATCO DRILLING, BORING, FACING AND TAPPING MACHINES

NATCO

NATIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Indiana

Branch Offices: CHICAGO, 2009 Engineering Bldg. • DETROIT, 409 New Center Bldg.
BUFFALO, 1807 Elmwood Ave. • NEW YORK, 35 Beechwood Ave., Mount Vernon

Call a Natco Field Engineer



Plan for Maximum Output with

BIRDSBORO ROLLS

When mill rolls are blueprinted and engineered to meet your specific requirements, you're more sure of getting the results you want. That's why you can *expect more*—and get it—from Birdsboro Rolls.

From basic design, through painstaking analysis control, to final installation, mill roll "tailoring" like this may well be your answer to higher production at a lower cost per ton.

Whether you're rolling alloy, stainless, high speed steels, or steels for advanced applications, the wide selection of Birdsboro Rolls assures you long-range rolling efficiency . . . greater freedom from maintenance and non-productive time. A Birdsboro Representative will be glad to be of assistance on any of your mill roll problems.

BIRDSBORO

R-9-52R

BIRDSBORO STEEL FOUNDRY & MACHINE CO., BIRDSBORO, PENNA. ROLLS Offices in Birdsboro, Pa. and Pittsburgh, Pa.

•designers and builders of: Rolls • Steel Mill Machinery • Hydraulic Presses • Crushing Machinery • Special Machinery • Steel Castings

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DEPEND UPON THE HANSEN REPRESENTATIVE

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H. U. Rogness, Inc., Minneapolis
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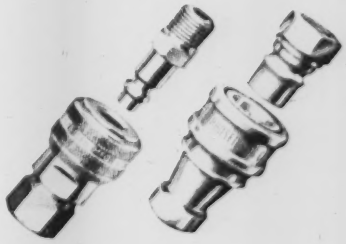

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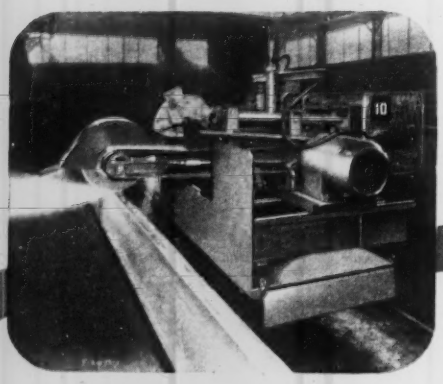

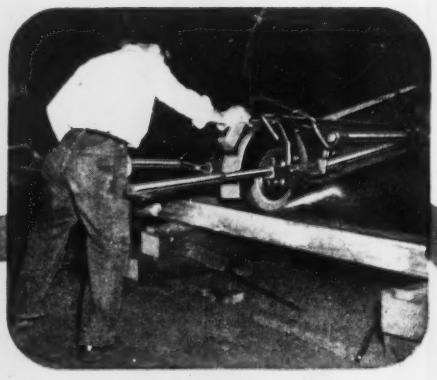

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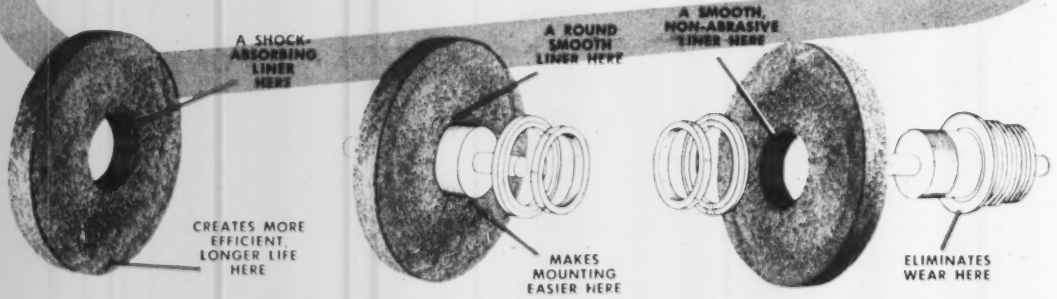

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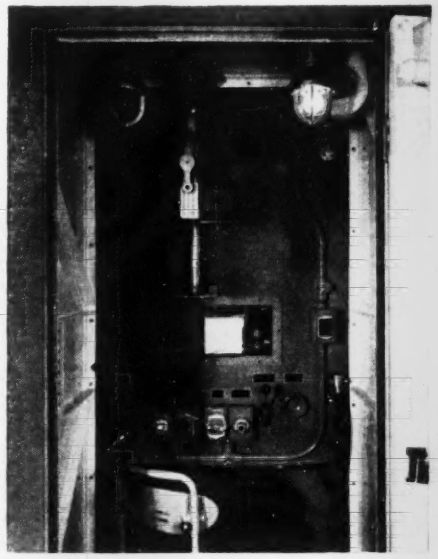
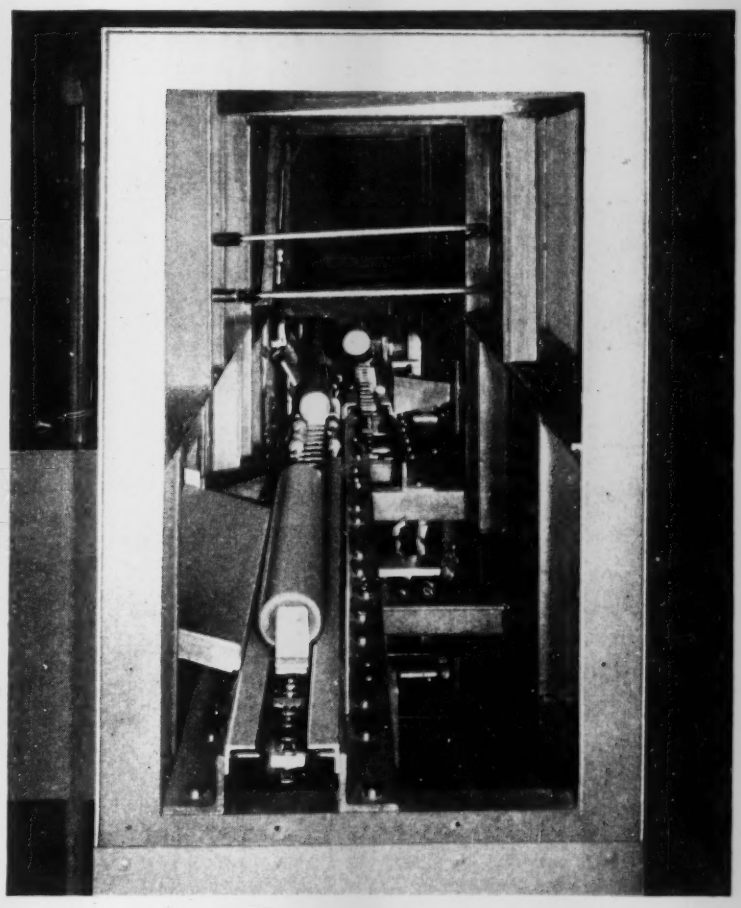


Operator's booth is X-ray proof with explosion-proof fittings; operator has control of speed, flow, inspection position, rejects grains by using push button.



Conveyor has chopper feeder to prevent jamming, carries continuous line (interrupted for photo) past X-ray cone, at right; grain at end has been rejected.

Inspection Problem Solved with Westinghouse Fluoroscopy

Advisory Service Available

Westinghouse now offers industrial fluoroscopy as well as conventional X-ray techniques. These methods have solved difficult problems; Westinghouse will be happy to consult with you on any special inspection problems.

At the Hercules Powder Plant, in DeSoto, Kansas, the Westinghouse Fluoroscopic unit (above) has been designed for internal inspection of explosive powder grains for airborne rockets. At left is the operator's booth, at right the conveyor. This X-ray unit permits a continuous stream of large, cylindrical grains to be thoroughly inspected by a single operator. Design provides for easy location and identification of defect areas and for the automatic rechanneling of faulty grains. Results: quick, positive, low-cost inspection without costly, cumbersome film requirements.

If you face a tough inspection problem it will pay you to investigate Westinghouse Fluoroscopic equipment. Westinghouse is equipped to apply the best technical assistance to the solution of your particular inspection problems. Call your Westinghouse representative or write to Westinghouse Electric Corporation, Dept. R-68, 2519 Wilkens Avenue, Baltimore 3, Maryland.

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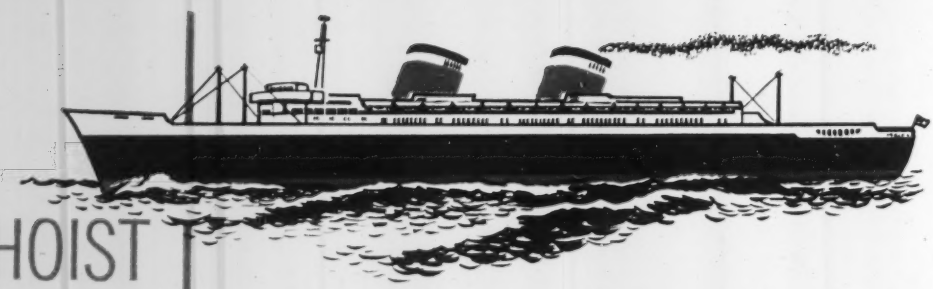

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CRANES help build the S.S. United States and other big ships for Newport News Shipbuilding and Drydock Co.

One of the largest shipbuilding and ship repair yards in the world, Newport News Shipbuilding and Drydock Co., designed and built the huge luxury liner, S. S. United States. They also build, convert and repair naval and merchant vessels of all types. For the many difficult materials handling operations this work entails, they need efficient and dependable equipment. That's why this company maintains a fleet of modern Brownhoist Diesel Electric Locomotive-Cranes.

Brownhoist Cranes perform equally well as switch engines or cranes operating with magnet, hook or bucket. Monitor Type Cab and Clear-Vision Boom give the operator full 360° visibility. Rugged construction, simplified mechanism, and easy accessibility to all moving parts help keep maintenance and repair costs low. In railroads, steel mills, mines and large manufacturing plants, Brownhoist Cranes are saving production time and money. They are built in capacities from 25 to 80 tons for virtually every materials handling operation. For complete information, consult your nearest Brownhoist representative or write us today.

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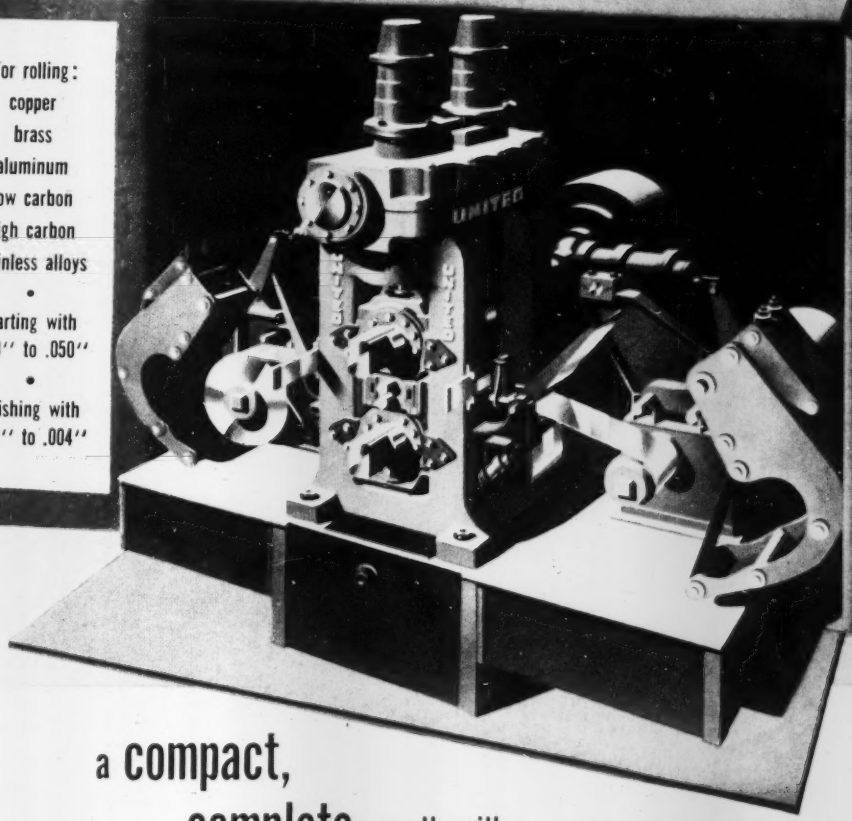

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a compact, complete small mill. No cellars or elaborate foundations needed

TO meet the need of many manufacturers for a small, compact, inexpensive mill for the cold rolling of narrow, thin strip, UNITED developed, and is now offering, a NEW, COMPLETELY INTEGRATED "PACKAGE MILL."

Each unit is furnished fully equipped with roller bearing mounted rolls, recirculating rolling coolant system, mill guides, tension reels, belt wrappers if desired, strippers, motors and drives, all mounted on a fabricated base which serves also as a rolling coolant reservoir. The mill illustrated is a reversing type with motorized screwdown.

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- Mill can be equipped for one way rolling by using a simple coil box instead of a reel.
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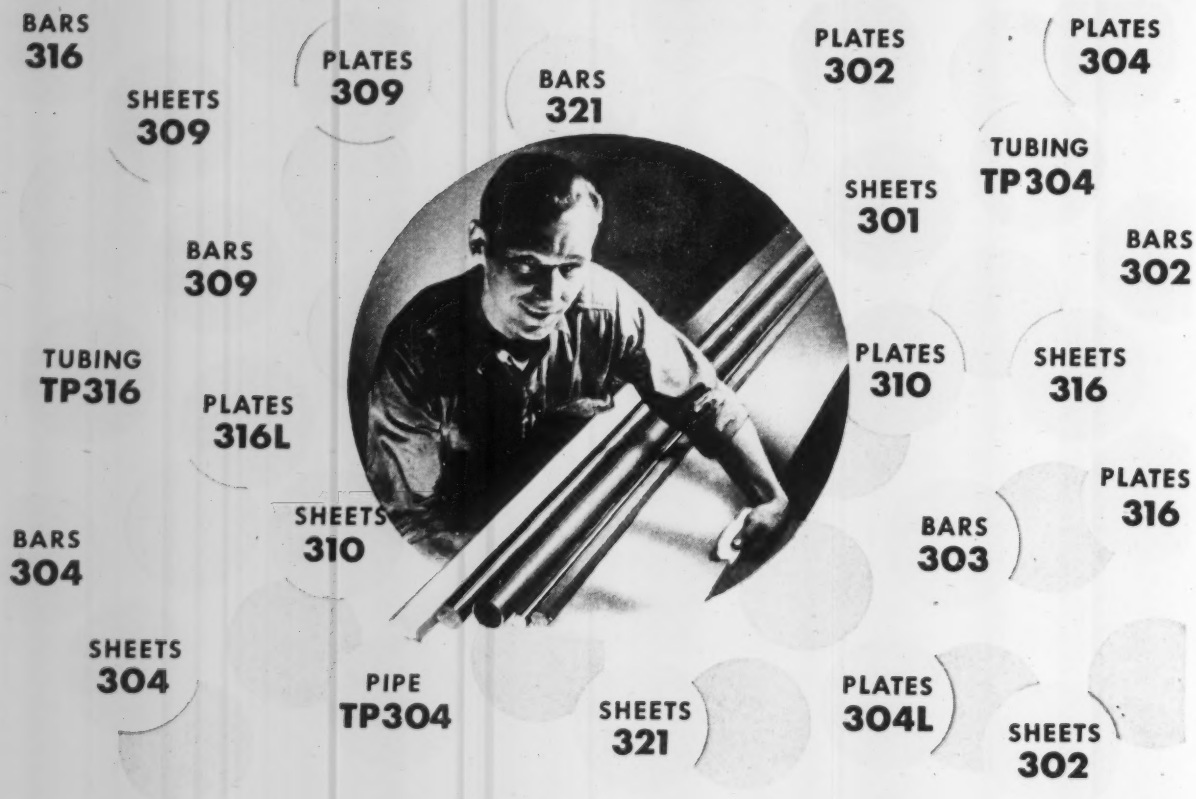

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RYERSON STEEL

Metalworking Outlook

December 7, 1953

Labor: Relatively Calm

When the records are tallied, 1953 will show up as one of the most peaceful labor years since the end of World War II. Even so, there were 4325 work stoppages in the first 10 months of the year, although only 0.24 per cent of the total possible working time in the period was lost through strikes. The 12-month average won't be quite that good because of some big walkouts in the last 30 days, notably in the canmaking and aircraft industries. This year has been a time of consolidation for most workers and unions. An average 7 cents an hour has been gained in direct pay, plus about 1.5 cents in fringe benefits. Union treasuries have done well, too. The United Steelworkers had a record net worth on June 30 of $13.8-million, $2.9 million over the net worth of $10.9 million last Dec. 31.

Conventional Approach

This year has also been characterized by a surprisingly conventional approach by Big Labor to the bargaining table, with straight demands and few proposals for gimmick arrangements. Indeed, the major gimmick of the last couple of years, the escalator clause, is gradually being abandoned. It's being slowly squeezed out of auto contracts. Although some 385,000 General Motors Corp. employees have just won a two-cents-per-hour boost because of the escalator, the concensus is that prices will be too stable in the next year or so to give workers much benefit from the device.

T-H and GAW

The sound and the fury from labor in 1954 will center around Taft-Hartley changes and the guaranteed annual wage. Don't look for marked developments in either case, although 1955 may see some union progress on GAW. Of the three unions that are doing the most tub-thumping about it, the United Auto Workers won't talk about details, the United Steelworkers and the CIO electrical workers both claim that it's management's responsibility to work out most details.

Coming: Aluminum Decision

Look for a decision late this month by Defense Mobilizer Arthur Flemming on whether or not we will have a third round of aluminum expansion. The Department of Defense is refiguring its needs for the metal now and will report to him Dec. 16.

Trouble in Titanium?

The noise over the titanium shortage made before the Senate subcommittee investigating strategic materials is dying, leaving the U.S. in about the same position as before. It has awarded contracts to date for about 13,800 tons, although annual output today is at only a 2000-ton rate. Defense mobilizers have set an annual goal of 35,000 tons of production. They're not getting that quantity because civilian markets can't absorb much ti

tanium at present prices, because more government money is necessary and because new production and recirculation methods must be developed.

Wheat from the Chaff

Government men watched with interest last week's Mid-Century Conference on Resources for the Future held in Washington. They look to it for guidance in formulating a resources policy for the U.S. It will take time, though, to sort out the wheat from the chaff at the affair because as many as 25 different sessions were being held at once in what some reporters have described as "the wordiest conference we've ever covered."

Just Holding His Own

The average high-ranking business executive is doing little more than hold his own on compensation. An American Management Association survey shows executive compensation increased less than 1 per cent in 1952 over 1951. Gross average weekly earnings of production workers in 1952 were 7.4 per cent above those of 1951. The average gain in management pay in 1951 over 1950 was 5.4 per cent; in 1950 over 1949, 10.3 per cent.

No Cause for Alarm

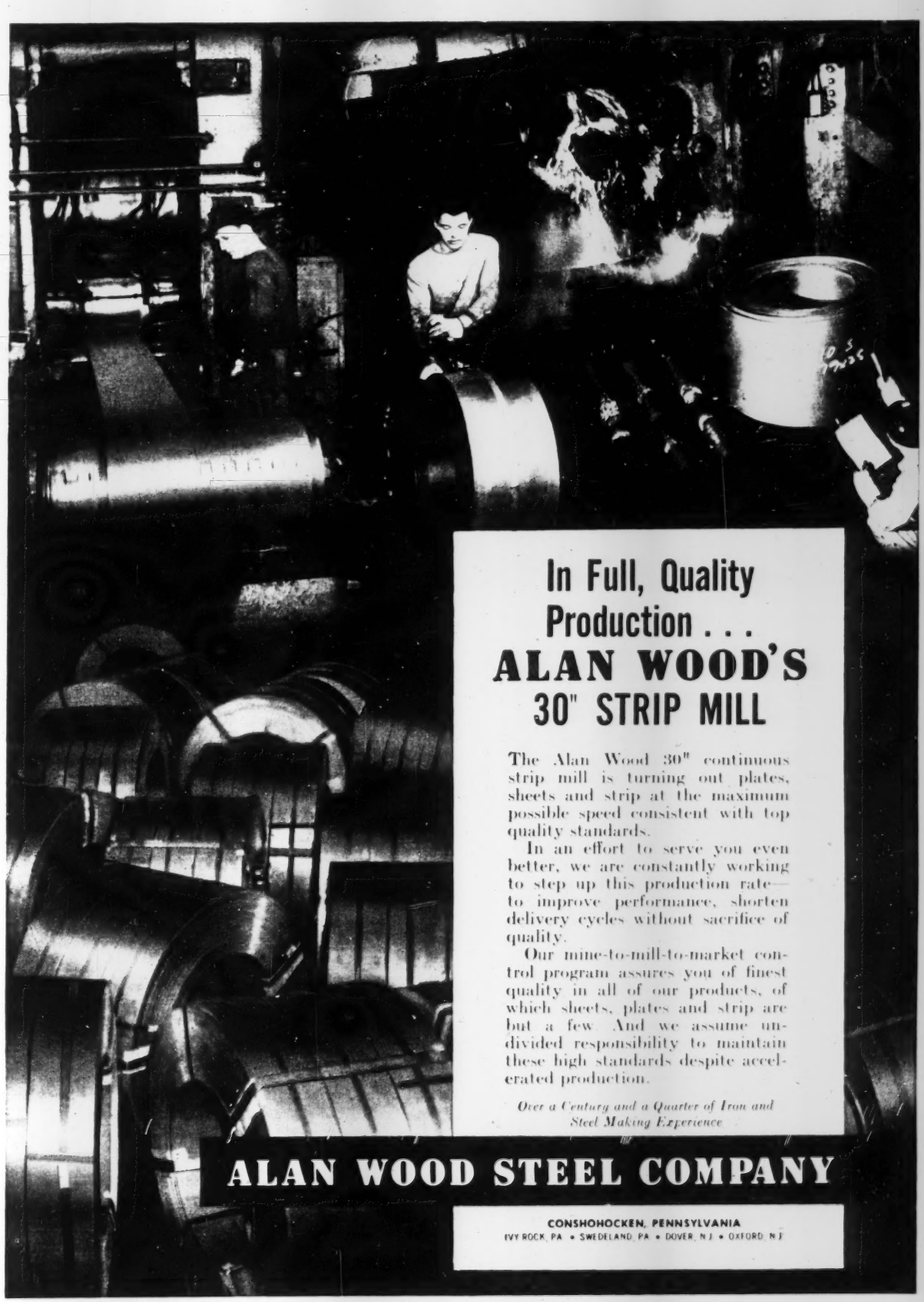
Equipment builders need not become alarmed at the government's decision to lease 116 of 540 machine tools it owns in the New Brunswick, N. J., plant of Brunswick Ordnance Corp., a subsidiary of Mack International Motor Truck Corp. This is no sudden easing in the U.S. policy to limit strictly the leasing of its equipment for civilian production. Rather, it's an interim arrangement whereby Brunswick Ordnance will be able to produce automatic transmissions for Ford Motor Co. for six months. That's the time Ford estimates will be needed for delivery and installation of new equipment it has ordered for a transmission line. Ford formerly got part of its automatic transmission requirements from General Motors' fire-ravaged Livonia plant.

Straws in the Wind

National Association of Manufacturers' annual dinner was televised to an overflow crowd in other Waldorf-Astoria rooms last week via closed circuit, thus illustrating a rising use for TV . . . It will be about another two weeks before Jones & Laughlin Steel Corp. can get back to normal operations at its Aliquippa, Pa., works tied up by a two-week strike which ended Nov. 30.

This Week in Metalworking

Total construction next year may hit $34 billion, off only slightly from the $34.7 billion expected for 1953 (p. 85) . . . American Institute of Steel Construction expects 1954 to be second only to the record 1953 in business (p. 86) . . . ODM says 68 expansion goals are still open (p. 87) . . . Fastener business will probably slip a little in 1954, but manufacturers are nevertheless optimistic (p. 89) . . . The mobile homes business is rolling (p. 90) . . . The Renegotiation Act will be extended next year, but chances are good for some liberalizing amendments (p. 91) . . . Specialized product shows are being used increasingly as a sales tool (p. 95).



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The Alan Wood 30" continuous strip mill is turning out plates, sheets and strip at the maximum possible speed consistent with top quality standards.

In an effort to serve you even better, we are constantly working to step up this production rate—to improve performance, shorten delivery cycles without sacrifice of quality.

Our mine-to-mill-to-market control program assures you of finest quality in all of our products, of which sheets, plates and strip are but a few. And we assume undivided responsibility to maintain these high standards despite accelerated production.

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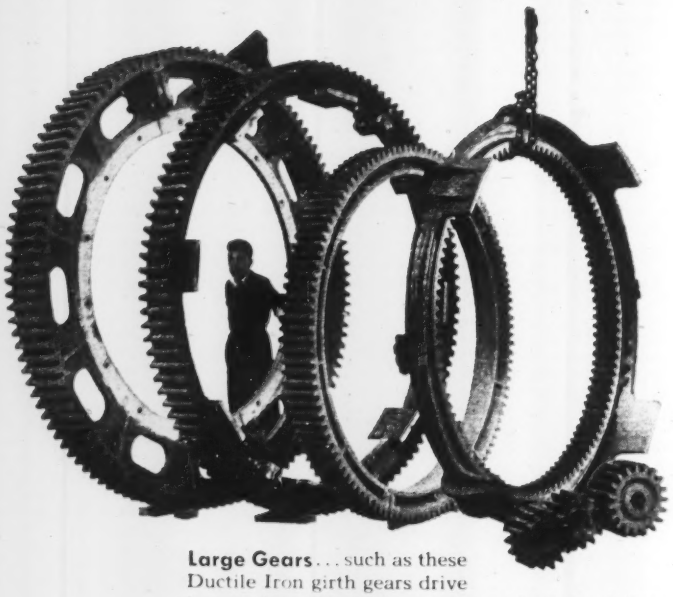
DUCTILE IRON GEARS provide *Superior Strength* with *Excellent Resistance to Wear*



Large Gears... such as these Ductile Iron girth gears drive large tube mills in the cement and mining industries. Put into service without heat treatment, they normally provide 92,000 to 100,000 psi ultimate tensile strength, 3 to 5% elongation, and 270-290 BHN on the tooth surface.

In addition to excellent castability, ready machinability and moderate cost, Ductile Iron offers properties that are vital in a gear material.

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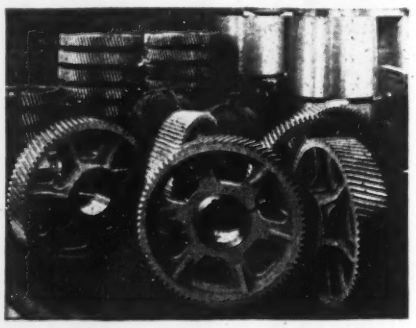
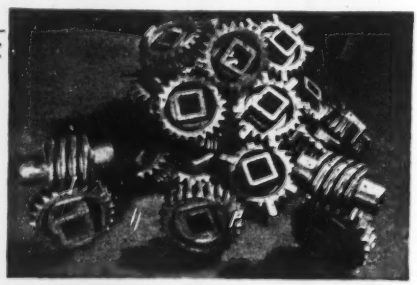
Ductile Iron can be heat treated to provide tensile strengths of over 150,000 psi. It develops surface hardnesses of over 600 BHN after flame or induction hardening. Service data show also that annealed Ductile Iron develops impressive properties which result in peak performance.

Ductile Iron can provide a chilled, carbidic, abrasion-resistant surface supported by a tough ductile core. No other single material combines these properties. Still another advantage is its ability to damp out vibrations that otherwise might build up stresses to dangerous levels.

Send us details of your prospective uses, so that we may suggest a source of supply from some 100 authorized foundries now producing Ductile Iron under patent licenses. Request a list of available publications on Ductile Iron . . . mail the coupon now.



Medium Gears produced in heat treated Ductile Iron have replaced steel gear castings and forgings in papermaking and allied equipment. Annealed Ductile Iron can be machined at a rate of 2 to 3 times that of good quality gray iron of comparable hardness.



Small Gears . . . also worms . . . exemplify an application of Ductile Iron in the railroad field.

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THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET NEW YORK 5, N.Y.

New Quarterback in '54

We are in the period when men are predicting the state of business in the new year. Thus far, two unusual features are noticeable in the prognostications for 1954. One is that predictors have been revising their predictions upward as the new year draws nearer. The second is that there is a greater degree of uniformity in the predictions than in some previous years.

Several months ago it was not uncommon for economists, business analysts and others to say that they expected industrial activity in 1954 to drop 10 to 15 per cent, or even more, below the 1953 level. Now there is an impressive degree of unanimity in the belief that activity next year will not drop as much as that. One group believes the decline will be only 4 to 5 per cent. Answers from 129 leading economists polled by F. W. Dodge Corp. indicate that volume in 1954 will be only 3 per cent lower than in 1953. Recently a number of writers have predicted that gross national product in 1954 will exceed that of 1953.

If these forecasts turn out to be fairly accurate, we will witness the remarkable phenomenon of three consecutive years in each of which the output of goods and services (gross national product) exceeded that of any previous year. On the basis of a mean of these forecasts, gross national product would be around $350 billion in 1954, as compared with $368 billion in 1953 and $348 billion in 1952.

Any close approach to a gross national product of $350 billion in 1954 would mean that industrial executives could look forward to a favorable economic climate in which to do business. However, one note of caution is in order. While 1954 may shape up favorably statistically, there are certain to be changes in the character of business that will merit close attention.

One of them is the shift from a sellers' to a buyers' market. In fact, the companies that will fare best in the economic climate of 1954 most certainly will be those whose officers are quick to do the things that should be done when the buyer is calling the signals.

E. L. Shaner

EDITOR-IN-CHIEF

RESEARCH IS POTENT: In this issue the editors allot liberal space to a subject that is becoming increasingly important to metalworking establishments. The subject is marketing research (p. 125). While it may seem to be formidable to production-minded executives in thousands of small and medium-sized establishments, it is one of the most opportun-

ity-laden projects that can be undertaken by any metalworking company.

Remember this important fact. Until recently we were in a sellers' market. Now we are in a buyers' market. The buyer is in the driver's seat and he demands more value at less cost. Solid facts that can be constructed from objective market research are all to the good. In fact, we would say that market research is in the process of becoming one of industry's most potent weapons.

LET'S NOT BE BLUFFED: Now that the Soviets are intensifying their boastings about the progress they are making in agriculture and industry, it is gratifying to note that more and more writers in western nations are suggesting that some of these new claims be taken with a liberal dose of salt.

Writing in the *American Legion Magazine* under the title "Russia's Big Bluff," Harold Lord Varney enumerates a long list of blunders made by western nations because few persons "have realized that the dark warnings of a Russia armed to the teeth which have come to them from both press and Pentagon have been based upon nothing more substantial than guesswork and apprehension." *Barron's* of Nov. 30 carries a provocative analysis entitled "Claims of Russian Strength Ignore Some Hard Facts." Some of Sir Winston Churchill's recent memoirs reveal incidents which indicate that our representatives were unduly impressed by Soviet claims.

THOSE FAKED REPORTS: These belated inclinations to question Soviet boasts are a sad commentary on the short memory of Americans. After the revolution in Russia, numerous American engineering firms were called to Russia to design and build iron and steelworks, refineries and other industrial facilities. Five-year plans were inaugurated and in the new zeal of a reborn nation the people went all out to beat the quotas which had been set up for them.

In those days our own American engineers, returning from Russia, told us of incredible tales of Russian duplicity and stupidity. Workers on a blast furnace, somewhat remote from Moscow, were so anxious to report that the stack was completed ahead of schedule that they erected a dedication stand on a wooden scaffolding alongside the furnace. Long before the stack was actually completed, they raised the Soviet flag on the platform atop the scaffolding, conducted their dedication ceremonies and wired Moscow the stack was completed. At about this point the scaffolding collapsed, sending scores of premature celebrants to their deaths.

ACTUAL VS. PROJECTED: Possibly the impulse to exaggerate or deceive is an oriental trait. After hearing American engineers tell about Soviet fibs in Russia, this writer received an assignment shortly after World War II to investigate the Russian removal of Japanese-owned properties in Manchuria and other points in the Far East.

In talking in Tokyo to the Japanese owners of plants in Korea, Manchuria or Formosa we had great difficulty even through competent interpreters in determining exactly what facilities actually existed in these countries. We would be shown impressive blueprints indicating a full-fledged steelworks of blast furnaces, open hearths and rolling mills. Only by dint of prolonged questioning could it be determined that the plant at that moment consisted of a heating furnace and a crude bar mill and that the blast furnaces, open hearths and other mills were merely "contemplated" for construction at some future date.

ACHIEVEMENTS SPOTTY: In questioning Soviet claims one should be careful not to underrate the potential of Russia for trouble. It has great strength in spots, and this fact should not be taken lightly. However, its strength is thin and unbalanced. Even with the forced efficiency that can be promoted by dictatorship coupled with slave labor, years must elapse before Russia can have the balance of facilities and the volume of capacity that are required for the maintenance and preservation of a sound economy.

Soviet Russia has a few major accomplishments to her credit, but she still is one of the most backward nations in the world in regard to the well-being of her citizens. Notwithstanding the Kremlin's boast that Soviet agriculture is more heavily mechanized than any other in the world, the yield of certain grains per acre in 1953 is less than it was almost half a century ago.

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WIRETEX Steam Hose **will not burst . . . can not** suddenly spray out super-heated steam, blinding steam, maiming steam; yes, even killing steam.

For what you are now paying for ordinary steam hose, you can insist upon getting WIRETEX Steam Hose . . . with a Safety Factor far beyond that provided by ordinary steam hose specifications.

Ask your local Republic Rubber Distributor. If his name is not listed in the yellow pages of your telephone directory, write directly to us.

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INLAND TI-CO® GALVANIZED SHEETS WITH THE ZINC COATING THAT ROLLS WITH THE PUNCH

Construction

BOOM CONTINUES

(billions of dollars)

1954	$34.0*
1953	34.7
1952	32.3
1951	30.9
1950	27.9

* Estimated by Department of Labor and Department of Commerce

SUPPLIERS to the construction industries are receiving heartening news as plans for 1954 building take form. The picture is brighter than expected.

It now appears 1954 easily will be the second largest year for construction. It will be within 2 or 3 per cent of the 1953 peak dollar volume.

Two months ago, estimates of 1954 activity indicated a drop of possibly 10 per cent from this year's total.

Harbinger — The healthy construction prospects are encouraging businessmen to believe the expected dip in general business activity will be much milder than was anticipated earlier. They recall that construction activity is credited with partially arresting the threatened slump in 1949 and possibly averting a more severe recession.

Plans Laid—The 1954 estimates are more than just expectations. Many of the projects included are based on programs which now are beyond the stage where they can be canceled out readily. Bond issues for much of the public construction are approved and in some cases contracts are let. Utility, government and some industrial construction are part of large programs which were predicated on a dip in general business in 1954, a dip which likely will be more slight than was anticipated earlier.

In private residential building and other categories where fluctuations are easy, the chances for increase over present estimates should not be overlooked.

The Estimates — Expenditures for new construction next year are expected to total about $34 billion, a dip of only 2 per cent from the record volume of $34.7 billion in 1953 (see the accompanying table). The dip will be occasioned by a mild contraction in private construction. Public building will be at about the same level as this year. This is the joint appraisal of the Labor and Commerce departments.

The government appraisal is supported by Dodge Reports which predicts a decline of 3 per cent from 1953 to 1954.

Housing — Residential construction in 1954 is estimated at about 975,000 units, compared with slightly more than 1 million in 1953. In dollar volume, the decline is expected to be 7 per cent.

Outlays for home improvements will increase sharply, possibly as much as 20 per cent. This will reflect expansion in smaller houses to accommodate growing families and rehabilitation of older houses.

Housing estimates are subject to change. New starts will vary in relation to the prosperity of the buyers.

Farm construction will drop an estimated 12 per cent, due largely to the depressed farm income.

Factories — Private industrial construction is over the peak and will decline rather sharply. Expenditures for factories will be just under $2 billion, compared with just under $2.3 billion in 1953 and the record $2.3 billion in 1952 when defense expansion hit its peak.

Government industrial building also will drop, again reflecting the completion of the bulk of defense building.

Private commercial building will be stronger and will rise to nearly $2 billion from $1.7 billion this year. Warehouses, office and loft buildings, stores, restaurants and

garages will enjoy a boomlet as materials and manpower for their construction become freely available.

Schools, recreational facilities, churches and other nonresidential buildings will increase moderately. The high prosperity of 1953 encouraged subdivisions to submit many bond issues for such improvements at the fall elections and many were approved.

Utilities — Railroads and local transit lines face a relatively poor year, but all other utilities will rise. Electric power and light, gas, telephone and telegraph and pipelines all will spend more for construction next year. Utility expenditures will exceed $4.5 billion.

Government — Construction activities by the government will show little change. Declines in public residential, industrial and military and naval facilities will be offset by increases in highway and educational facilities.

Second Best

Despite rising competition, structural steel men see 1954 as second only to the record 1953

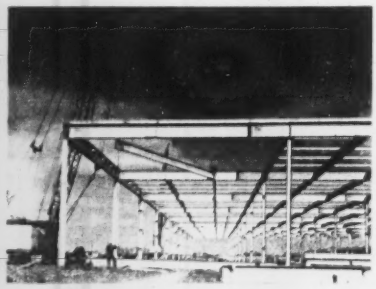
STRUCTURAL steel fabricators may enjoy their second best year in 1954, but they will have to sell harder and figure closer on costs and estimates.

The volume of new construction will continue at a high level, although the emphasis is shifting from industrial to commercial building. The shift already is in evidence and will continue through 1954. Structural steel fabricators already are feeling the more intense competition as construction moves into the more commercial-type work.

That is a consensus of representative fabricators who attended the 31st annual convention of American Institute of Steel Construction at Boca Raton, Fla., Nov. 30-Dec. 3.

Closing Record Year—"The year 1953 will establish a record for fabricated structural steel shipments at about 3 million tons. Bookings are running ahead of 1952, and the current backlog is about eight months.

A busy year in 1954 is predicted by L. Abbett Post, executive vice president of the association. "The building boom may be tapering off slowly," he says, "but largely as the result of three years of limitations on construction, there is still a tremendous potential demand for schools and other institutional buildings, for commercial buildings and for highway bridges. In addition, we can expect continued industrial expansion both in industries which will share in the apparently never-ending defens program and in industries which are gearing up to produce new products or to meet a growing demand of our expanding population."



STRUCTURALS CONTINUE STRONG
. . . but more selling is needed

Gains Cancel Losses—Fabricators believe gains in commercial buildings, highway construction, and utility work will offset the loss in private industrial construction in 1954. The latter type building now accounts for about one-third of the fabricators' total volume. Commercial and utility construction account for more than 20 per cent of the total fabricated structural steel bookings. Bridgework, highway and railroad account for about 30 per cent.

Depression-Proofing—An encouraging economic long view was offered the fabricators by R. B. Heflebower, head of Northwestern University's Economics Department. Professor Heflebower told that a deep prolonged depression such as occurred in the 1930's is not likely in the future because: 1. We have learned to build resistance to depression; 2. we have a more liquid business; 3. the federal government which now controls at least 20 per cent of national spending is bound to be a more controlling factor in the economy and will be in a position to prevent the "peculiar coincidence of conditions" creating the 1930 depression.

"The construction industry of the future will be less of a prince-or-pauper industry than it was before World War II," says Professor Heflebower.

Economic Hypochondria?

Former AEC Chairman Lilienthal says we concentrate too much on minor business ills

REALIZATION of what's right with industry today is being overshadowed by too much attention to minor ills, says David E. Lilienthal, former chairman, Atomic Energy Commission and Tennessee Valley Authority.

The country is acting like an "economic hypochondriac" when its industrial growth is quite healthy, he told 800 chemists, chemical engineers and manufacturers at an American Chemical Society dinner that marked opening of the 24th Exposition of the Chemical Industries in Philadelphia Nov. 30-Dec. 5.

Union—Mr. Lilienthal, now an industrial consultant and chairman of Attapulgus Minerals & Chemicals Corp., pointed out the striking array of new chemical products and processing equipment at the show as an impressive demonstration of "what's right with America, economically speaking." Speaking of the interrelation of chemistry and metalworking, he asserted "the mark of the transformation chemicals and brains have brought about can be seen in almost every metalworking plant the country over from the concentration of low-grade ores to the creation of major metals."

Nearly 500 exhibitors pointed up these industry trends: More continuous process rather than batch-type operations; wider use of materials handling equipment; larger and heavier equipment with automatic lubrication systems; extensive use of instruments for control and measurement; more efficient liquid and gaseous waste recovery and disposal systems and greater use in the community-relations conscious industry, and availability of a wide variety of new construction materials to resist corrosion, wear, heat and cold.

Expansion Goals: 120 Down, 68 To Go

Chances for ODM approval are good on fast amortization applications in any of the 68 industries which the agency thinks must still be expanded

THE DOOR to fast tax write-offs stands open on 68 expansion goals, says Arthur S. Flemming, director of Office of Defense Mobilization. In addition, further expansion of 49 other goals, over and above the 68, is being considered.

Accelerated tax amortization has already been granted for 18,427 new or expanded facilities with an estimated cost of $28,800,257,000. Of this, about 60 per cent or $17,332,828,000 is eligible for fast write-off.

Still Needed—Although 120 of the presently established 237 expansion goals are being closed, Mr. Flemming served notice that the program is far from completed. In the table, right, of the 68 goals which are still open, several items are 100 per cent subscribed that is, commitments have been made from combined foreign and domestic sources to meet expansion needs. But these goals are being left "open" to facilitate increased domestic output when necessary.

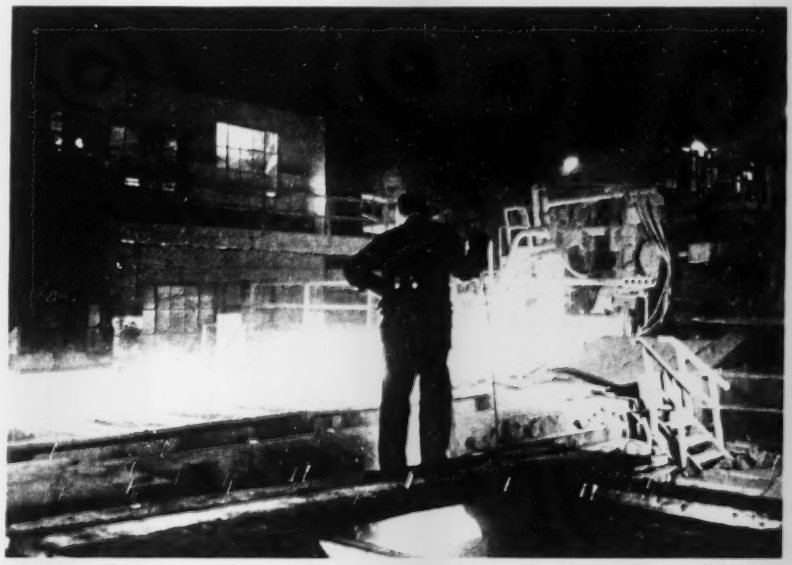
EXPANSION GOAL	Estimated % Subscribed
Aircraft, commercial	95
Alkylate	57
Alumina	84
Aluminum, primary	88
Aluminum sheet & plate heat treating fac.	48
Aluminum sheet & plate producing facil.	97
Ammunition metal boxes, 30 and 50 cal.	26.4
Antimony	100
Asbestos, chrysatile, strategic grades	40
Barite	100
Bauxite	100
Beryl	70
Boilers, steam	85.5
Casting, steel	93
Chromite, chemical grade	40
Chromite, metallurgical grade	100
Chromite, refractory grade	100
Cobalt	80
Coal, metallurgical	100
Coke, by-product	95
Columbite & tantalite ores	100
Copper	100
Cryolite, synthetic	40
Cylinders, compressed gas	52.1
Electrolytic, tin plate	93
Electronic products, military	77
Fluorspar, acid grade	100
Freight cars	69
Gas pipe, large, lines laid	27
Gas pipe, small, lines laid	24
Gray iron castings over 3,000 lbs.	5
Heavy aluminum aircraft forgings	50
Heavy steel plate over 20,000 lbs.	New Goal
High voltage switchgear	83.9
Inland waterway vessels, spec. types	53
Iron ore	100
Iron ore, taconite	30
Laboratories, research and devel.	Not applicable
Lead	100
Locomotives, diesel	61
Manganese ore, battery & chemical grades	70
Manganese ore, metallurgical grade	100
Mercury	100
Metal can mfgr. (tin conservation)	59.9
Military photographic equip.	55.6
Molybdenum	100
Natural gas liquids capacity	30
Nickel	80
Oil, crude, refining capacity, domestic	30
Oil pipe lines, domestic	63
Oil storage facilities, domestic	25
Ore carriers, great lakes	50
Ore carriers, ocean-going	3
Rare earths	100
Rutile	100
Scientific instruments	65
Selenium	70
Steel sheets, grain oriented	97
Structural shapes, wide flange	83
Tankers, ocean-going	26
Tapered aluminum sheet	30
Tires (specific-types)	98
Titanium metal	50
Transformers, distribution	85.7
Tungsten ore	100
Turbines, steam	49.2
Welded aluminum tubing	74
Zinc	100

U. S. Steel Wins Tax Write-off

U. S. Steel Corp. received the second largest certificate of necessity for fast tax write-off granted by the Office of Defense Mobilization from Nov. 5 to 18. Certificates were granted to 52 firms in the period for projects amounting to $85 million.

U. S. Steel's certificate is for a $17.7-million expansion of its grain oriented silicon steel sheet facilities in Vandergrift, Pa.; 50 per cent write-off was allowed.

Other metalworking certificates granted by ODM went to Bethlehem Steel Co. for $1.5-million metallurgical coke facilities at Lackawanna, N. Y., 25 per cent allowed, and for $10-million electrolytic tin plate facilities at Sparrows Point, Md., 40 per cent allowed; General Electric Co., for $3.8-million project for research and development of military items at Schenectady, N. Y., 55 per cent.



Wide World

Steel To Span the Hudson

First steel for Hudson river bridge on New York State Thruway is rolled in U. S. Steel's Homestead District Works, Munhall, Pa. In all 55,000 tons of steel for this three-mile-long bridge will be fabricated and erected by American Bridge Division of U. S. Steel. The bridge is expected to cost $60 million

More Plants, More Volume for Metalworking in 1952

	1952			1951		
	Total Number Plants	Number of Employees	Value Added by Manufacture (Thousands)	Total Number Plants	Number of Employees	Value Added by Manufacture (Thousands)
Primary metal industries	5,500	1,239,570	$ 9,045,495	5,490	1,244,210	$ 9,768,640
Fabricated metal products	17,953	1,007,589	7,168,308	17,552	1,035,246	7,138,582
Machinery (except electrical)	20,336	1,650,533	12,805,556	18,734	1,603,987	11,218,656
Electrical machinery	4,421	956,337	6,868,847	4,294	876,551	5,753,226
Transportation equipment	3,610	1,635,270	11,924,276	3,393	1,468,509	9,788,928
Instruments and related products	2,835	273,936	1,958,071	2,686	253,081	1,608,236

NONELECTRICAL manufacturing led the metalworking industry in the increase in the number of new plants in 1952, according to the latest Department of Commerce annual survey of manufacturers. Pacing the industry in dollar volume gain for the period was the transportation industry (see table).

According to the survey, there were a total of 267,000 manufacturing plants in the nation in 1952 as compared to 262,000 in 1951. The food industry led in the number of plants with 36,829 listed. Following were printing and publishing, 30,147; apparel and related products, 28,979; nonelectrical machinery and fabricated metal products.

Broken down according to size of plant, over 46,000 of the better than 54,000 plants represented in the above six metalworking industries were plants employing less than 100 persons. In the 1000-2499-employee classification there were 825 plants and in the over-2500-employee group there are 417 manufacturers.

Small Business Sounds Off

It plugs for gradations in corporate income taxes, but U. S. officials take a dim view

SMALL BUSINESS' dependence on retained earnings as a source of money for growth is seriously threatened by the present tax structure, a symposium on "Federal Taxation and Small Business" heard last week in New York.

Small enterprises that can't tap the outside money market by issuing securities are finding the scales tipped against their chances for survival, one panel member observed.

Gradated Corporate Tax—Sponsored by National Association of Independent Business, which is headed by Herbert Barchoff, Eastern Brass & Copper Co. Inc., the symposium panel inspected NAIB's tax program for small business. The proposal would not lessen federal corporate revenue, but would increase levies on large corporations by 3 points.

It calls for a 15 per cent levy on profits up to $50,000, 47 per cent from there to $100,000 and 55 per cent beyond that point. Present law calls for 30 per cent tax under $25,000 and 52 per cent above.

Little Encouragement — Congressmen Hale Boggs, Robert W. Kean and Antoni Sadlak of the House Ways & Means Committee, and Daniel Throop Smith, special assistant to the secretary of the Treasury, gave little encouragement to the NAIB proposal. Their arguments, capsulized:

Taxing corporations as in individual income taxes on basis of ability to pay is a "specious sort of analogy."

Soaking big firms would be hitting small investors: The larger the corporation, as a rule, the smaller the stockholder.

Many small enterprises are not incorporated but operate as individual proprietorships. They would have to be helped too.

First going after individual income taxes, where the big bite is, would be the best way to restore and encourage initiative.

Matter of Money — Whatever the answer, legislative enactment would be difficult. With excess profits tax going off, individual income taxes scheduled to drop 10 per cent and corporate levies slated by present law to dip to 47 per cent (though chances of their doing so are considered dim), the government stands to lose an estimated $5 billion in revenue and will look with skepticism at any program for further alteration of the tax structure.

ASME Honors Kennametal Head

Philip M. McKenna, president, Kennametal Inc., Latrobe, Pa., received the American Society of Mechanical Engineers' Holley Medal at the organization's meeting in New York last week.

Commenting on his company's operations, Mr. McKenna said his company accounts for close to 30 per cent of the $75-million sales volume of today's cemented carbide industry. Titanium carbide now accounts for about 5 per cent of company sales. Tungsten carbide sales volume is made up of 60-70 per cent from metal-cutting tools, 10 per cent mining tools and the remainder wear-resistant parts and projectile components.

Good Weather Ahead for Springs

There's no pessimism on the program of the nation's springmakers for 1954.

Wherever there are moving parts you'll usually find a spring, so the industry's operations are often considered a good index of future business. Backlog today is holding at about 45 to 60 days for most springmakers. That's about double the normal range.

New products to be introduced next year offer plenty of sales opportunities for the industry, said members celebrating the 20th an-

niversary of the Spring Manufacturers Association in New York Dec. 1. In two decades spring sales have sprung from $25 million to $150-175 million today, said J. D. Culbertson III, Duer Spring & Mfg. Co., McKees Rocks, Pa., association president.

Elected as director was Walter Froglich, Wallace Barnes Co., Bristol, Conn. Officers were re-elected.

Distribution Cost Study Set Up

An Advisory Committee on Cost Justification has been established by the Federal Trade Commission to study the possibility of setting up cost distribution yardsticks to help enforce Robinson-Patman Act.

"Although savings in cost constitute the primary justification for lawful price differentials under the act, there has been little advancement of distribution cost accounting," Edward F. Howrey, chairman, states. "Business concerns, particularly small business, have been unable to determine precisely what cost savings are allowable and how they may be proved."

Correspondence from interested groups is invited by the committee. The communication should be addressed to Prof. H. F. Taggart, chairman, Advisory Committee on Cost Justification, Federal Trade Commission, Washington 25.

Shale Oil Development Urged

Pilot plant operations for extracting oil from oil shale should be government-financed if the oil industry cannot do the job by itself, A. C. Rubel, vice president, Union Oil Co. of California, told a Senate subcommittee studying Western Hemisphere self-sufficiency of critical materials and fuels.

Cost of the 1000 to 1500 barrels-per-day pilot plant recommended would be $5 million to $7.5-million. To build a commercial plant with output of 50,000 barrels of shale oil per day, including a necessary pipe line to Los Angeles, would be $306 million. The latter would be needed to tap the 100-billion-barrel deposits in Colorado.

Mr. Rubel called development of shale oil production facilities "the cheapest insurance against a serious and perhaps a critical shortage of liquid fuels in the time of war."

Production schedules will be trimmed in . . .

Corrective Period for Fasteners

A GOOD YEAR in 1954.

That's what fastener makers are looking forward to. Not that sales or production curves will continue upward. They probably won't. But, even with the expected 10 per cent drop in dollar sales, 1954 will be better than the early-Korea year of 1950.

New Perspective—To get overall fastener sales into proper perspective, it's necessary to go back to 1951, the top sales year for the industry. Dollar sales shipments is the term used by the industry to denote sales were down 15 per cent in 1952 from the 1951 peak. Sales (or shipments) are up an average of 11 per cent for the first nine months of 1953 over the same period of 1952 nearly back to the 1951 peak.

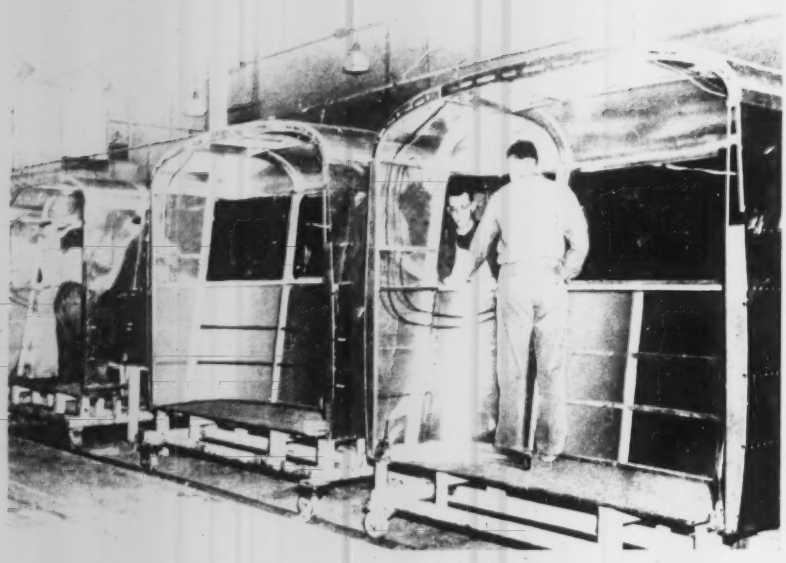
Next year, a 10 per cent drop again will settle sales somewhere between the peak high of 1951 and the comfortable 1952.

The Conditions — Here's how the fastener industry shapes up at present. There's virtually no trouble with raw materials supplies; deliveries on standard items are within 30 days, more often than not they can be made from stock; backlogs are shrinking; markets for the fourth quarter, 1953, are described this way:

Automotive trade is only fair; appliance makers are good or mediocre as fastener customers depending on the product they produce room air conditioners, food freezers and electric dryers all being good now; railroad and construction markets are only so-so; aircraft, shipbuilding and farm machinery markets are definitely weak.

A market revival is expected about the first of the year, however. In Detroit, the guess is sometime between mid-December and February. One eastern manufacturer puts it: "Our customers' inventories are pretty low and they will have to replenish stocks soon."

Price Prognosis — As might be expected under these market conditions, fastener makers are not planning any price increases. Most go along with Robert Ritchey, assistant general sales manager, Townsend Co., New Brighton, Pa., when he states: "We can bluntly say there are no increases under way, barring a change in the labor contract. In fact we are trying to find ways of decreasing our prices."



Ideas from metalworking will be welcome as . . .

Mobile Home Makers Get Set for Competitive Pinch

JUST BEFORE World War I a New York department store manager looked over a tent-on-wheels rig which its maker claimed was a house trailer. Sharing the inventor's enthusiasm for the trailer, the manager placed an order for several, but they didn't sell. With the transportation of the period where could a trailer owner go?

Transportation today over the nation's highway network, however, offers few problems to house trailer owners and the trailer industry has mushroomed into a $300-million business, the biggest expansion being since World War II. An estimated 2 million persons are now living in house trailers, or mobile homes as the manufacturers prefer to call them.

Pep Talk—Last week members of the Mobile Home Manufacturers Association placed on display in Cleveland some 250 mobile homes for the Trailer Dealers National Association members to view. It was the pep talk for the sales campaigns coming up for 1954.

Dealers and manufacturers alike expect 1953's volume to equal 1952's $319 million. Most agree that the squeeze will be on in 1954; predictions of who'll be pinched hardest vary with which side of the fence you're on. A large manufacturer said he thought the small, marginal producer will be eliminated; a small Wisconsin mobile home maker said, "It'll be the big boys who'll feel it because of higher costs."

All The Comforts—In any event, prospective mobile home buyers will be getting a better home. At the show, folding front porches, two bedrooms, attics, air conditioning and built-in television were some of the new luxuries added to the near standard items of built-in kitchens completely equipped with range, refrigerator, sink, garbage disposal and cabinets along with modern bathrooms and indirect lighting. Cost of the mobile home ranges from $2000 to $8000 or more for units up to 50 feet long.

The critical housing shortage following World War II and the tremendous mobile workforce which developed, particularly in construction, gave the industry its greatest impetus. With housing easing and the mobile workforce leveling off and even declining in some areas, the industry is out to find a new sales boost.

Target—Probable big sales target next year: The retired man and wife. Manufacturers point out that about 225,000 retired persons now live in mobile homes. "For them it's a natural," they say. "A mobile home is easy to keep clean, it provides all the conveniences and luxuries possible plus the advantage of following the milder climate."

For metalworking, the mobile home industry offers a sizable market. "About one-third the cost of the mobile home materials goes to metalworking for aluminum sheeting, the chassis and running gear," one maker states. Then too, the appliances come primarily from metalworking and are a major part of the over-all cost.

No Lid—And those markets are always open. Said one large manufacturer: "We're always open to new ideas to make our homes more appealing and comfortable. Right now I wish I could find the right kind of hardware for our homes."

No AISI Pessimism on Steel

Estimating steel production this year of between 112 million and 113 million tons the greatest ever attained Max D. Howell, executive vice president, American Iron & Steel Institute, believes that a decline in operations from the "feverish pitch of the war years" might be a good thing.

"A falling off in the industry's operations would provide opportunities to improve the products of the industry, to develop sound markets and to increase the efficiency of our equipment and processes."

Mr. Howell expressed this opinion at the institute's regional technical meeting in Philadelphia, Dec. 3.

He estimated that the eastern steelmaking district of eastern Pennsylvania, New York, New England, Delaware, Maryland and New Jersey would produce about 8 per cent more steel this year than ever before, pointing out also that the district capacity increased over 29 per cent from the start of 1948 to the beginning of 1953, against approximately 25 per cent for the industry as a whole.

Military Surplus Must Go

"Operation Clean-Sweep" to rid the military supply systems of surplus needs has been launched, Charles E. Wilson, defense secretary, announces. Chief aim of the program will be to make the supply system more flexible and responsive to the demands of military operations.

Renegotiation: Certain To Be Extended

The only question is what amendments to the existing act will be approved. Some Democrats oppose Senate Finance Committee recommendations as emasculating

THE RENEGOTIATION Act covering defense contractors' earnings will be extended beyond Jan. 1 especially because the excess profits tax will be allowed to expire at that time.

H.R. 6287, introduced by Rep. Dan Reed (Rep., N.Y.), in the last session of Congress to extend the controversial measure, passed the House and was reported out by the Senate Finance Committee but not acted upon by the Senate.

The Question—In the next session the job will be to get both houses to agree on amendments to the legislation. The Senate committee amendments of the last session may prove objectionable to many legislators. The changes aim at streamlining the renegotiation process by exempting many more contractors. Sen. Paul Douglas (Dem., Ill.) and other Democrats oppose them and say they would emasculate the act. One would increase to $500,000 the present minimum of $250,000 per year of renegotiable receipts and accruals requiring review. Another would broaden the present exemption of "stock items" to include all "standard commercial articles" wherever there is competition in the sale of such articles.

Taking its cue from the Senate Finance Committee's recommendation for more favorable treatment of the machine tool industry, the Renegotiation Board is already exempting more companies from renegotiation of their renegotiable profits in 1951 and 1952. Of every 100 filings reviewed by the board for those years, only 46 were renegotiated, 20 of them "formally" and 26 "informally." The other 54 cases were thrown out because the compaines report less than $250,000 a year of renegotiable sales or because the refund of the company would fall below the $10,000 minimum collectible under the law.

Help—Fewer companies will be renegotiated in 1953 because the board recently increased the minimum refund on 1953 profits to $20,000.

Renegotiation is slow; the board, with its regional boards, is able to process about 6000 cases a year. It now has a backlog of more than 6000 cases and more can be expected because many companies subject to the act have not filed for 1952. The board expects to dispose of the bulk of 1951 cases early in 1954 and to clean up on most of the 1952 cases by one year from now. But many cases involve special factors and will hang on longer. Then, many companies undoubtedly will choose to appeal the proposed settlements to the U.S. Tax Court which might take another couple of years.

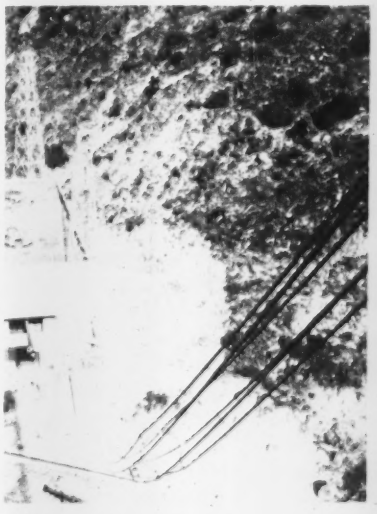
For Durable Goods—An amendment now under discussion but still to be formulated would prove helpful to manufacturers of machine tools and other durable productive equipment. In March, at the instance of the Senate Finance Committee, the board eased its regulation to entitle sales of such equipment to an automatic partial exemption from renegotiation when the equipment was bought by private parties with their own funds. This exemption is determined by a fraction in which the numerator always is 5 (the approximate length of the defense mobilization period) and the denominator is the number of years of expected life of the tool. Thus a fraction of 5/20 indicates that the renegotiable portion of the cost of a tool bought by a private concern would be 25 per cent. The board also allows a further exemption covering use of such equipment during the initial 5-year period for nondefense production.

The board says that these partial exemptions have not proved as beneficial as the machine tool and equipment industry hoped because most of the tools bought during the defense period were paid for with government money and were used mostly for defense production. The amendment now proposed (in a bill to be introduced by Representative Reed, chairman of the Ways & Means Committee) would apply the partial exemption also to tools bought with government money.

In the Right Direction — The board also points out the necessity for fair renegotiation of the machine tool and equipment builders in view of the threat that they may have saturated their markets for some years to come because of big sales during the defense period. As a further concession, the board recently advised the machine tool industry that earnings in 1951-1953 will not be considered excessive just because they exceed those of 1946-1949.

Board spokesmen insist they are expediting renegotiation with all possible dispatch. Where delay has occurred there has been ample cause. For example, the easement in the machine tool and equipment regulation resulted in a six-months' delay in that industry's cases.

Long Uncertainty—These delays keep the company managements in an unenviable state of uncertainty. They do not know how much of the profits they banked in 1951 and 1952 is theirs. They do not know if they have followed sound dividend policies. They don't know what to tell stockholders.



Biggest Antenna

About 150,000 feet of steel copperweld cable across Jim Creek valley, Arlington, Wash., forms the largest radio antenna in the nation. The radio will send messages to fleet units of the U.S. Navy throughout the world

By E. C. KREUTZBERG Washington Editor

Commerce Is Spokesman But No Lobbyist for Business

"MOONSHINE." That's how Commerce Secretary Sinclair Weeks describes accusations that his department is developing into a government lobby for business and that it strives for policy-making powers over other units, notably the Department of Labor.

The fact is, the White House is definitely determining the policy-making aspect of all problems within its ken hence some of the decisions that have not always been wholly acceptable to business.

Change of Heart . . .

For example, Commerce officials now think there will be no steel or other industry councils in the Business & Defense Services Administration. The White House was cool to the idea. Originally, Commerce officials felt that the appointment of councils from each major industry would provide media for uncovering industry problems as they arose and would allow the government to take fast action to solve or alleviate them.

The latest thinking is that the Commerce department already has its industry divisions in BDSA, plus industry advisory committees that can perform such a role in most cases. Supplementing them can be task groups appointed from time to time to consider specific matters.

Bad Services? . . .

That and other shifts by the Administration relating to business have brought some mutterings from businessmen. Business & Defense Services Administration was originally hailed as a potential champion of business by many executives in private industry who reasoned that any group staffed so largely by recruits from private industry would certainly be markedly sympathetic to business. The agency has been sympathetic,

MARSHALL M. SMITH
. . . one-time E. W. Bliss Co. president named deputy assistant secretary of commerce for international affairs

but not markedly so, and the performance thus far has gained it the nickname, from some of the more easily disillusioned, of BAD Services Administration.

Wide Influence . . .

That, of course, is the extremists' view. While it is no lobby for business, Commerce does have wide influence and can give industry's viewpoint, even in problems that don't directly concern the department. Take the general components survey that the Office of Defense Mobilization is so hot about. Defense Boss Arthur Flemming has made the Defense and Commerce secretaries and the Atomic Energy Commission chairman directly responsible for unraveling "the deep, dark mystery" of components in the mobilization readiness picture. The unraveling is necessary so ODM can launch any new expansion programs to fill in existing gaps in mobilization capacity.

Chairman of the ODM Components Committee is William N. Lawrence of the ODM staff.

Representative industry men will be called in frequently for information in this complex industry which comprises some 8000 firms grouped into 54 industry categories and manufacturing many hundreds of component items. Industry task groups already organized number 31 and at least 30 to 40 more are to be appointed. In addition, individual companies will be called in on specific products.

Cheering Section . . .

Commerce also serves as a cheering section for the business viewpoint on problems outside its ken. That's the role it played in cheering on a project to cut paperwork and legal expense for manufacturers having dealings with the U.S.

The President's Conference on Administrative Procedure, chairmanned by Court of Appeals Judge E. Barrett Prettyman, has agreed on an agenda of 21 methods of improving and facilitating present procedures of the departments and agencies and has also voted to recommend establishment in the Department of Justice of an office of Administrative Procedure to push adoption of the improved time and work-saving methods adopted by government units.

A Voice at Court . . .

Secretary Weeks' concept of his job is: Be the advocate for business at the White House and fight for those issues that are not contrary to the public interest. Although the White House has made it clear that it determines what the public interest is, industry, through the Commerce department, at least has a voice at court.

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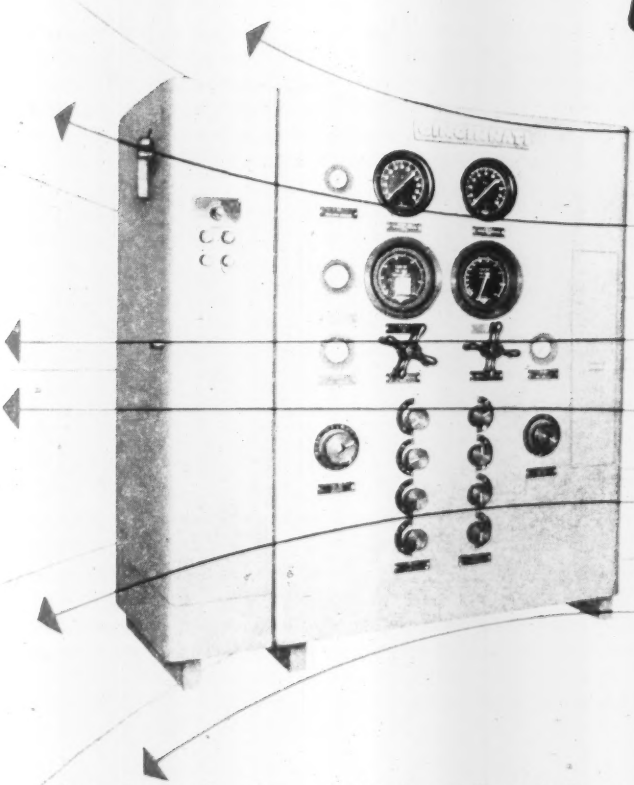

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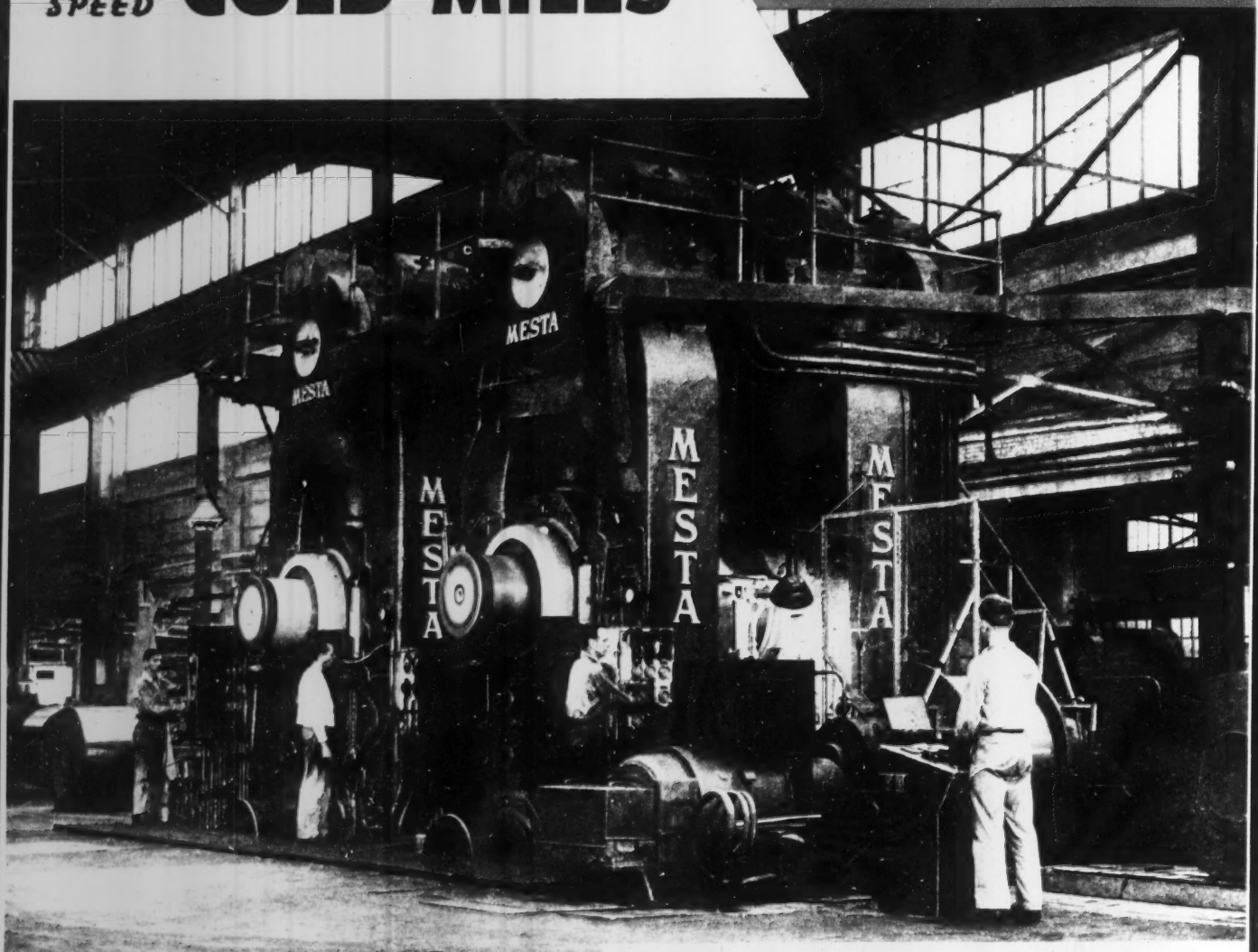

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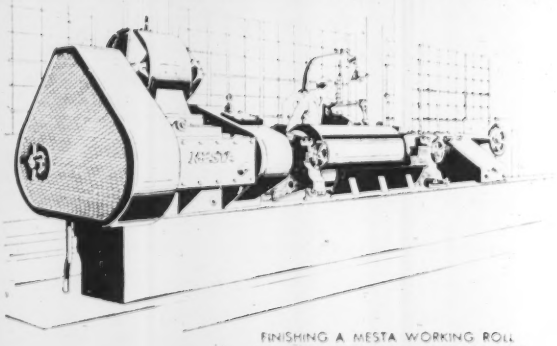

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MESTA MACHINE COMPANY

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Special Shows Sell

Production Service

"IN TWO DAYS we gained as many topnotch business prospects as one good salesman gets over a four-year period."

That's the observation of one large optical equipment manufacturer after the two-day Cleveland Quality Control Show sponsored this fall by Production Service Co., a Cleveland manufacturers' agent. Admittedly not a new idea, the specialized exhibit is gaining favor as a sales tool as competition becomes keener.

Some exhibitors have turned to the small show because they cannot get space at the large national affairs or because they feel they are overlooked in the mammoth exhibit halls. Others, however, point to the many intangible values of the large showings and feel that the special exhibit fills the sales gap between the industry-wide shows and the salesman.

More for the Money—Many who have tried the idea are quick to point out that the results are far more tangible than the exhibits they sponsor at some of the national shows. There are several reasons for this.

First, the viewers at the smaller shows are hand picked. For instance, Henry Bothe, vice president of Production Service, sent out about 5000 invitations to customers of the eight manufacturers his company represents in the Cleveland area. Invitees were top-flight executives who had the authority to buy. The show was advertised only in a limited way so that anybody missed on the invitation list could call the company, thus showing more than tourist interest and thereby getting an invitation. Most select showings are run on a similar basis.

Standouts—Second, each individual exhibit is given prominence which is not overshadowed by several larger and more "glamorous" booths. One of the chief criticisms of the supershows is that "my booth got lost in the shuffle."

Another way of measuring the success of special showings is monetary—the number of sales directly traceable to the show. In the case of the Cleveland Quality Control Show, Mr. Bothe reports actual sales at the show were $14,532, with $86,520 worth of sales since as a result of the affair. In addition about $16,490 in sales made during the two days is pending. Even more important, perhaps, is the fact that 22 per cent of the 1002 persons signing attendance cards asked for a sales representative to call.

Thrifty — That is inexpensive selling when cost of the exhibit is considered. Each of the eight exhibitors stood his own direct cost, which averaged about $75. The brunt of the finances, about $5000 in all, was borne by Production Service. However, Mr. Bothe explains that in the first hour of the show a guest purchased a $6200 optical comparator. He says the show has already paid for itself in direct and indirect benefits.

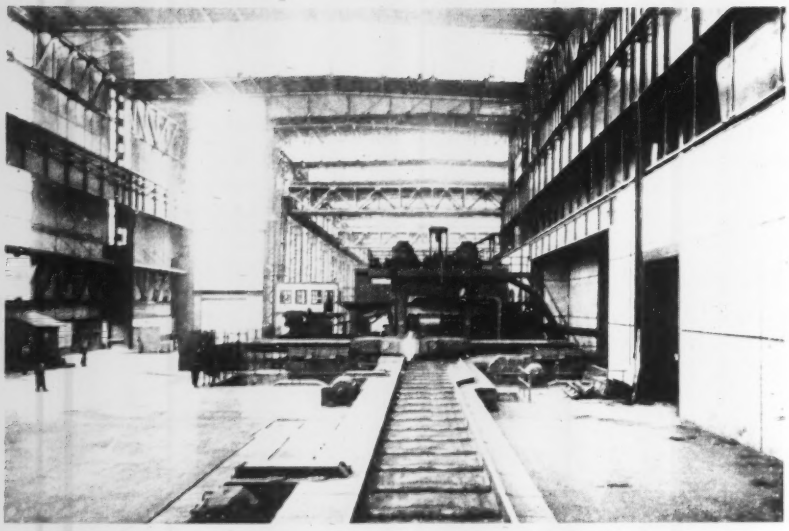
The idea is catching on fast all over the nation. The particulars may differ, but the idea—more direct, selective, low-cost selling—is the same. The forms will usually take one of five patterns: 1. That mentioned above; 2. where the manufacturer alone exhibits, usually in his own plant; 3. where manufacturer and consumer jointly sponsor the showing, usually in the latter's plant; 4. where the manufacturer, distributor and consumer jointly co-operate, and 5. where several manufacturers in an area sponsor an exhibit as a community project.

Added Feature. — Some companies, such as Interstate Machinery Co. Inc., Chicago, have been using this selling tool successfully for a number of years. Interstate this year held its fourth show in its own plant. It has proved so successful that the company has added a special clinic with speakers to discuss important metal-working problems. Attendance at the show was over 2000.

Trade groups can use this technique to advantage, also. Electric League of Western Pennsylvania recently held a three-day exposition in Pittsburgh in which 33 manufacturers of electrical equipment showed their wares in 49 booths. Harry H. Johns Jr., manager of the league, said several large orders were attributed directly to the show.

Contagious—The idea is contagious. R. L. Guimont, a manufacturers' agent in Indianapolis, after attending the Production Service show said: "It is my intention to hold a similar show in Indianapolis. It would, of course, only supplement our present selling efforts, but I do feel that it is a big step forward to combat the increased competitive selling situation that is confronting us from day to day."

EUROPE PRIMES FOR COMPETITIVE 1954



CORNIGLIANO: ITALY'S NEWEST INTEGRATED STEEL MILL
. . . real operations will begin next year

ITALY

Transportation and farm equipment industries led a 13 per cent gain in Italian metalworking output for 1953. Italy readies aggressive export program for competitive 1954

ITALIAN INDUSTRY whittled away at its basic problems of modernization and encouragement of export trade in 1953 and made some progress.

The question for 1954 is whether generally increasing competition in world trade will work to Italy's advantage or disadvantage, whether the whittling will be enough.

Output Up—Metalworking output in Italy increased about 13 per cent in 1953 over 1952, due mainly to activity in the transportation and farm equipment industries. Motorcycles and scooters found ready markets, both in Italy and in export trade; production of automobiles, trucks, trailers and tractors was steady and export of these products increased. For example, car and truck output for first half, 1953, was 81,572, and exports were 16,597 compared with 65,832 and 14,055 in 1952's first half.

The average industrial production index for the first eight months of 1953 showed an increase of 9.4 per cent over the same period of last year. Extraction and processing of minerals increased 26 per cent this year over last.

Lurking Danger — Behind such encouraging factors, however, lurk certain soft spots in the Italian economy which indicate the important problems of overdependance on raw material imports and an unfavorable balance of trade have not been solved yet. These are factors which would be most adversely affected by increased pressure of foreign competition.

Still Dependent—Italian dependence on foreign raw materials is graphically portrayed in a United Nations study which showed Italy must import 25 per cent of the iron ore, 25 per cent of the scrap, 90 per cent of the coal and 100 per cent of the coke used in its steelmaking production.

While output of pig iron in 1953 was 3.5 per cent higher than in 1952, output of steel for ingots and castings dropped by about 8.5 per cent. Thus Italian steel production fell while steel consumption gained, forcing larger imports of steel products into an economy already plagued by excessive importations.

Not Standing Still — The Italian government hopefully has several cuts, or "whittles," poised for action next year. For one, Italy expects the European Coal & Steel Community to help solve its problem of high transportation costs on shipments of raw materials. Even under ECSC, it still costs Italians more to buy raw materials than other ECSC members because of higher transportation costs.

Italy already gets special consideration under ECSC by being allowed a customs duty on iron and steel products coming into Italy, giving added protection to the domestic Italian steel industry. Italy would like similar special consideration to compensate for higher transportation costs on shipments of raw materials from ECSC member nations.

Italian steelmakers will continue to be encouraged to modernize their plant and equipment. The new integrated steel plant at Cornigliano has begun production: One blast furnace, one open hearth and the reversible hot-rolling mill are in operation now. This plant will account for a higher percentage of Italian output when the semicontinuous cold-rolling mill and other facilities begin operating next year.

Chronic Ill—Further, the Ministry of Industry has an assistance program outlined for next year for small and medium iron and steelmaking plants, involving the spending of about $7.3 million (4.5 billion lira). The catch there is that

such modernization would necessitate the temporary dismissal of a number of Italian workers. Thus aggravating another of Italy's great chronic problems unemployment.

U. S. a Hedge—A final hedge against increased competition in world trade is U. S. foreign aid and off-shore procurement. Orders received under the latter program by Italy in the second half of 1953 promise to give employment to an additional 30,000 workers next year. In fiscal 1953, Italy received off-shore contracts totaling $240,000, third largest share.

Not bleak, not bright, the odds remain about even that Italy, with progress made thus far and new steps to be taken, will be able to keep up in the competitive race ahead.

SWEDEN

Downward trend in metalworking activity has not discouraged Sweden. Iron ore and steel processing capacity are being built up. Fewer imports, more exports are the goal

SWEDEN REEFED its metalworking sails during 1953 and came through the year in trim shape. The Swedes hope to do as well next year.

Swedish metalworking industries, suffering from growing competition in world markets, watched exports of machines and instruments decline 33 per cent during the first eight months of 1953 compared with the same period in 1952. Exports of railroad cars, locomotives and railroad materials were 25 per cent lower than in 1952. Even exports of iron ore turned down slightly.

About Even—On the other hand, exports of wood pulp and paper products jumped up enough to offset these losses, and total exports during 1953 about equaled 1952's $1562 million.

Metalworking production dwindled from the preceding year as employment dipped 9 per cent in electrical machinery, machine tools and general machinery fields. Output remained level in shipbuilding, jumped up in the automotive and aircraft industries. Swedes apparently rushed out to buy new cars this year as new car registrations were running 41,000 for the first half compared with 26,000 in the first half of 1952. Much of the gain came through imported cars. But Swedish manufacturers are taking an ever-growing share of the home market; one automobile firm plans to double output next year.

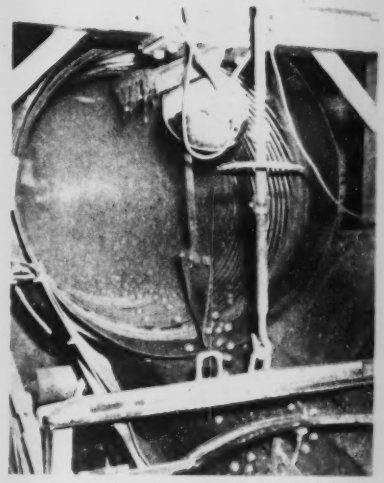
Still Even — Slippage in metalworking production was compensated for by an 8 to 10 per cent rise in textile, clothing, pulp and paper production. Net result: Total industrial output was about the same in 1953 as in 1952.

With the contraction of metalworking activity, it would seem the demand for iron and steel products should have diminished. That, however, was not true. New construction up some 20 per cent in 1953 coupled with a 50 per cent reduction in iron and steel imports, allowed for an increase in sales and output from Swedish iron and steel works.

Modest Gains — Output of steel for ingots and castings increased nearly 3 per cent from 1,152,800 tons during the first eight months of 1952 to 1,183,600 tons during the corresponding period of 1953. Output of rolled and forged steel products rose by nearly 5 per cent to 776,000 tons. While there has been a striking drop in new orders, Swedish mills still have six months' work on the books.

Sweden's steel industry is engaged in an expansion program which will raise capacity to nearly 2.5 million ingot tons by 1955; output of finished products will be brought up to about 1.6 million tons. Most of the primary steel capacity increase will be for merchant grades rather than special steels, reducing the need for merchant grade steel imports.

Not So Bad—Despite the slight 1953 decline in iron ore exports from the record 15.7 million tons of 1952, Sweden is optimistic about future ore prospects. Main factor in this year's dip was Sweden's shift from open pit mining to underground mining. Actually



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PELLETIZING SWEDISH IRON
. . . more capacity coming

Sweden's output of iron ore will be 40 per cent higher in 1955 than in 1950. By 1957, it's estimated Sweden's iron ore mines will have a 20-million-ton annual capacity, of which 18 million tons will be available for export.

Increases are projected for sintering and output of sponge iron, too. Sponge iron capacity can be expected to reach better than 200,000 tons a year in the near future. That will have the double benefit of increasing tonnages for export and reducing Swedish dependence on imports of charcoal pig iron and scrap.

Process Further — Along with that expansion, Swedish iron and steel mills have begun to set up capacity for further processing. Many now process from 25 to 30 per cent of the iron and steel produced.

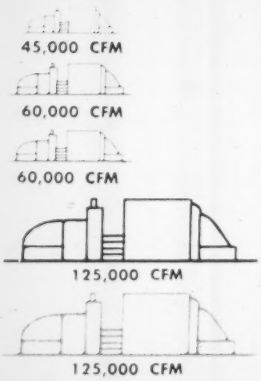
Thus Sweden, supplier of about one-third of the iron ore exports for world markets, is carefully building up iron ore capacity while at the same time adding facilities to further process and fabricate more of its iron and steel output a winning combination, the Swedes hope, for increasingly competitive world markets.

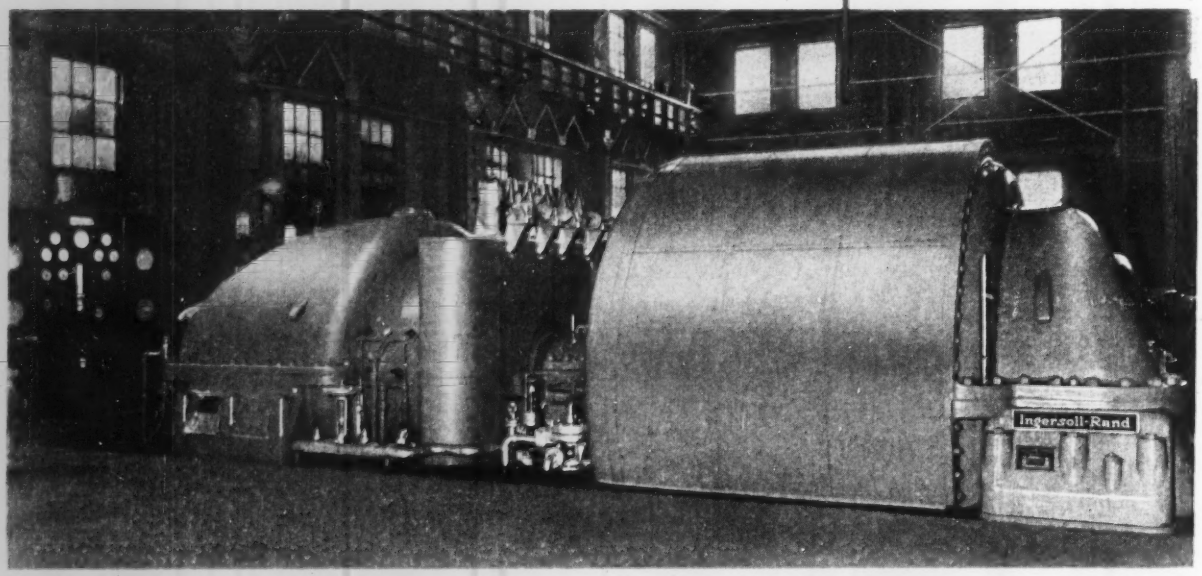
THESE articles begin a series on the economic presents and futures of the major European countries. Next week, Dec. 14, we will deal with Belgium and France.

Youngstown Sheet and Tube Company installs ITS FIFTH

I-R BLAST-FURNACE BLOWER

at Indiana Harbor Plant





The first I-R Blast Furnace Turbo-Blower installed at Indiana Harbor is still in daily service after 36 years of operation.

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PAST EXPERIENCE is one sure way of predicting future performance.

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The last two I-R Turbo-Blowers installed at Indiana Harbor, each rated 125,000 cfm, 35 psi discharge, are served by Ingersoll-Rand condensers, condensate pumps and circulating water pumps. Other Ingersoll-Rand equipment includes air compressors for plant air supply, instrument air and soot blowing, boiler-feed pumps and many other pumping units for miscellaneous plant service.

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Craftsmanship on Wheels: The Cunningham Automobile

WEST PALM BEACH, FLA. DOWN IN THE LAND of the motel and orange juice nestles what many will tell you is the car capital of the United States.

Not a few of these heretics live in Detroit, but perhaps a majority of them live in Europe. For West Palm Beach, Fla. is the home of B. S. Cunningham Co., maker of competition cars and sole bearer of the blue on white U. S. racing colors in recent years at the Le Mans Race in France.

Only 50—To thousands of auto enthusiasts here and abroad the Cunningham is the outstanding American car of our time and its racing record is a national credit. Yet only about 50 have been built since production started a couple of years ago—which means that your chances of being passed by one on the street are literally one in a million. And unless your car-Q is above average you probably haven't heard the name, let alone poked your sunburned nose into the clean, white Cunningham factory.

By Detroit standards the Cunningham hot rod hatchery wouldn't make a good-sized smudge on a plant layout. Scattered quietly around a few hundred feet of wall are a handful of machine tools, all clean and modern but highly unautomated. A major portion of the area looks much like the service department of any car dealer with perhaps half a dozen sparkling new Cunninghams undergoing tune-up and adjustment prior to delivery. Neat stock racks and a parts storage department pretty well complete the working area.

Just the Chassis — Before you conclude that the bodies must be braided out of palm leaves, it should be pointed out that Cunningham only makes the chassis of his production cars. The completed chassis are shipped to Vignale in Italy where the bodies are built integrally around the frame. But the chassis is a fascinatingly impossible combination of stock American components that makes the Cunningham go like a scalded cat.

Backbone of the setup is an orthodox frame welded from chrome-moly tubing. But to this unsuspecting rugged box are added a Ford front end, Mercury brakes, Dodge steering column, Dodge truck pitman box, Chevrolet pitman arm, Ford station wagon shock absorbers, Oldsmobile coil springs and a Ford gas tank.

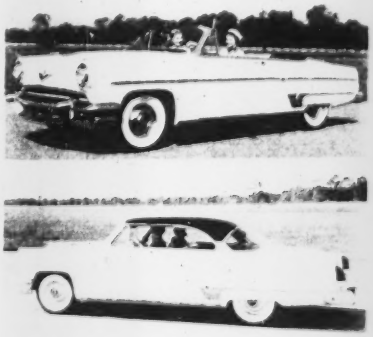
Power from Chrysler—Power is supplied by a Chrysler engine with a special Cunningham manifold and four carburetors giving a minimum hike to around 220 hp in standard cars with up to 310 hp available through further modification on request. Each engine is given a minimum of four hours break-in on a small but highly efficient Detroit-type test cell. Only after the engine has been thoroughly checked out at the requested horsepower does it go into the chassis.

You might suspect that the resultant guts of the Cunningham would be about as integrated as a farmer's wash. Actually this 105-inch package is about the most integrated piece of machinery running today. Phil Walters, general manager of the plant and one of the country's top racing drivers, demonstrated the chassis in the unique way each is thoroughly tested before shipment to Italy.

Precision—Steel weights giving the exact body weight distribution are attached to each end of the chassis. Then a wooden platform with a pair of springless bucket seats is added to accommodate the driver and an observer with safety belts to keep them in the "car." With the standard 45 pounds of air in the tires and sitting practically on the frame, the Chrysler engine roars into life through mufflerless exhausts and away you go.

This is the suspension that has opened the mouths if not the eyes of many a Detroit engineer. In the acid test, accelerating through a curve over a railroad track, the rear end displayed absolutely no tendency to break away. Cornering at speed on the open road was superb and all the while the ride on that thin padded cushion was better than anything produced in Detroit, bar none. And this, mind you, with 45 pounds of air in the tires rather than 18 or 22, and with a full 9 inches of spring travel which is supposed to flip a sports car like a turtle in a tight turn.

Body by Vignale—The Vignale bodies which are added to the chassis are equally astonishing. Fabricated of sheet aluminum except for the front fenders which are sheet steel, no two of the bodies are alike. Craftsmen at the Vignale plant in Italy start with sheets and literally



Lincoln Unveils

Coming and going, the 1954 Lincoln looks a lot like the 1953 Lincoln, but bumper guard air scoop, redesigned side molding and integral back-up lights are features that will make the car easy to pick out on the street. Carburetor and distributor have been improved and new color options are offered. Capri convertible is shown above; below is Capri hardtop coupe

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Auto, Truck Output

U. S. and Canada

	1953	1952
January	612,815	424,559
February	623,793	464,577
March	752,474	525,024
April	782,453	570,464
May	685,390	542,559
June	713,206	542,479
July	757,595	226,134
August	641,152	322,755
September	605,228	595,715
October	651,153	656,767
November		548,782
December		569,715
Total		5,989,509

Week Ended	1953	1952
Oct. 31	145,311	155,037
Nov. 7	133,783	143,610
Nov. 14	115,748	146,825
Nov. 21	108,252	129,224
Nov. 28	74,941	117,315
Dec. 5	100,000*	129,005

Source: Ward's Automotive Reports
*Estimated by STEEL

create the bodies by hand hammering into a series of tree stumps with variously contoured depressions in the top. Not even the windshield from one car will fit into another, and all of the windows are curved slightly, incidentally, to conform to the body contours. Vignale just liked them better that way.

Interiors of the cars are exquisite as only custom work can be with two comfortable bucket seats in front and a usable luggage space behind them which can double as a rear seat on short hauls. The trunk is only large enough for a pair of swimming trunks or a beret, being largely occupied by the spare tire. Incidentally, Cunningham uses a Cadillac trunk latch and his order for 50 caused quite a bit of excitement in Cadillac quarters. Seems that the trunk latch life expectancy is pretty good and consequently stocks are relatively low on the part—half a dozen supplying the entire Caddy replacement demand annually. When the Cunningham order arrived, researchers suspected that something was haywire with their trunk latches to create this mortality rate until the matter was explained.

A Blend—The Cuaningham is a remarkable blending of hot rod and sports car. Even with the Chrysler fluid-torque transmission it gets from 0-60 mph in less than 10 seconds, and its top speed is around 125 mph. A rich man's toy, the car costs $9500 up, and one customer recently spent over $3000 for custom body work following a relatively minor collision. The same job probably would have run $500 for an American mass-production model.

But if you happen to be in the class that can shell out $10,000 for a two-seated grocery wagon you'll look far to find a more outstanding car than the Cunningham. The car is as eminently impractical as delicate china and fine glassware and stands in just about the same spot automotivewise. And even with the price tag as high as it is, the company loses money on every car sold. It estimates the cost would be around $25,000 if the bodies were custom built in this country instead of Italy.

Curvemaster Scrutinized

A new device is getting more than a casual look by automakers as possible original equipment for the future. Dubbed the Curvemaster, the device acts to counteract centrifugal force rolling the body of the car outward in a sharp curve by tying down the inner springs by vacuum.

Control head of the device is a mercury switch actuated by centrifugal force. Moved sufficiently to make contact, a high-G solenoid valve system is electrically energized which in turn energizes one or two vacuum power cylinders. The power cylinder is coupled across the spring between the sprung and unsprung weight of the inner front wheel suspension. The cylinder in effect pulls the sprung weight downward, banking the body of the car inward for the curve. Vacuum for the cylinders is stored in a reservoir from the engine manifold. Movies of the device in operation are impressive.

The beauty of the unit is that riding qualities under normal circumstances are undisturbed. Presently available in kit form for custom installation, the device or a variation of it could well be on your car of the not-too-distant future. The address, if your interested: Dawson-Vogel Engineering Co., 1860 Cherry St., Columbus 5, O.

Nash Cuts Average $67.64

The Nash price cuts on the 1954 line are still another indication of the competitive times ahead for automakers.

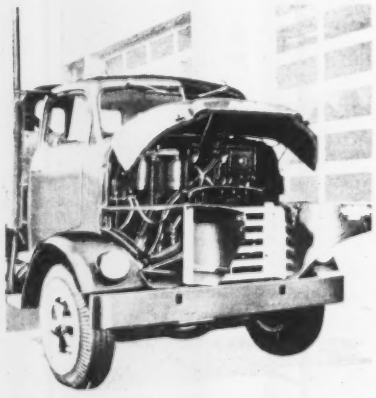
Nash-Kelvinator Corp. cut the prices of 10 of 15 models by amounts up to $160.75. Two models were raised by more than $30. Three models are new to the company's line for 1954, so no price comparisons are possible.

For those models reduced in price, the average decrease was $67.64. The biggest slices were limited to Nash's highest priced Ambassador series, with the average drop figured at $131.50 for that group of four models.

Twice as Many Trucks

America's truck fleet has doubled in size during the past 15 years, and its work load has more than tripled, Automobile Manufacturers Association reports in the 1953 edition of *Motor Truck Facts*.

The number of motor trucks registered in the country will reach an all-time peak of about 9.5 million by the end of 1953 — a growth of 105 per cent since 1939. Truck ton-mile totals on rural roads rose from 50.7 billion in 1939 to 152.1 billion in 1951. In 1904 only 700 U. S. trucks were built, contrasted with 1952 when 1,212,790 were turned out.



Open for Business

Handy feature of 1954 GMC heavy duty cab-over-engine trucks and tractors is the easy engine access provided by hinged doors on either side of the grille. Accessories have been relocated. Distance from front of bumper to back of cab is only 62 inches

for SPEED QUEEN

Here's Why ...

Exacting distribution of weight, complexity of shape, corrosion resistance—these are the required properties obtained at low cost by designing this part to be ZINC Die Cast. It is the balance ring in the pictured Speed Queen automatic washer.

Only simple trimming operations have been performed on this part by the die caster—the balancing nibs are integrally cast around the periphery of the ring, and the holes and slots (for easy assembly on the bowl-shaped spin tub) are cored in the die casting operation. The weight (16 lbs.) is thus distributed properly to achieve perfect balance of the tub for quiet, vibrationless operation at high speed. And the ZINC alloy resists the attack of moisture and detergents with which the ring comes in contact in service.

This metal and method of production is solving more and more specific physical and economic problems in more and more product designs each day. Ask us or any die casting company for a copy of our new booklet "The End Uses of Zinc Die Castings" which has 48 pages of successful ZINC Die Casting applications.

ZINC IS FREELY AVAILABLE

The American Zinc Institute has issued a new folder which gives the facts on why "zinc supplies will continue to be sufficient to meet both near and long range requirements". Ask us for a copy.

The New Jersey Zinc Company
160 Front St., New York 38, N. Y.

ZINC
FOR DIE CASTING ALLOYS

The Research was done, the Alloys were developed, and most Die Castings are based on

HORSE HEAD SPECIAL (99.99 + % Uniform Quality) ZINC

For the long haul... Autocar relies on RB&W bolts

Famous truck builder rates them best for ease of assembly and accessibility

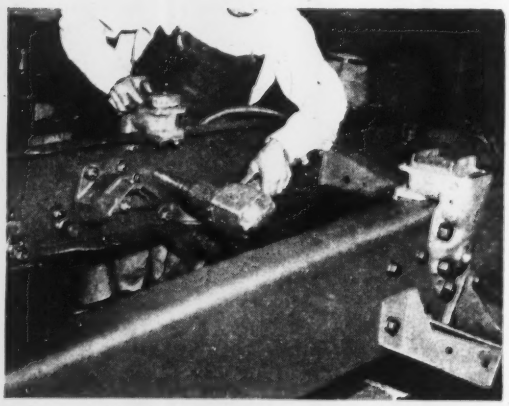
It's been a long time since the Autocar people switched from riveted to bolt-and-nut construction. Here's how it happened:

Two Autocar engineers took off on a coast-to-coast run to shake the bugs out of a new test model. Things went well until a riveted spring bracket broke. It took an entire day just to chisel through the rivets because it was hard to get at the bracket.

From that day on, it was *accessible* bolt-and-nut construction exclusively for all Autocat trucks. And Autocar standardized on RB&W bolts. One dividend from using these rugged bolts is that Autocar can specify higher-strength material than is practical for riveting. Furthermore, tests on structures like bridges show that rivets frequently loosen. This doesn't happen to bolts on Autocar frames.

Where you want to join structural members firmly together so they'll *stay* together for good, high-strength bolting is often your best bet.

As the leading manufacturer of all kinds of fasteners, we're in the unusual position of always being able to recommend and supply the right ones for all your needs. Write to RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N. Y.



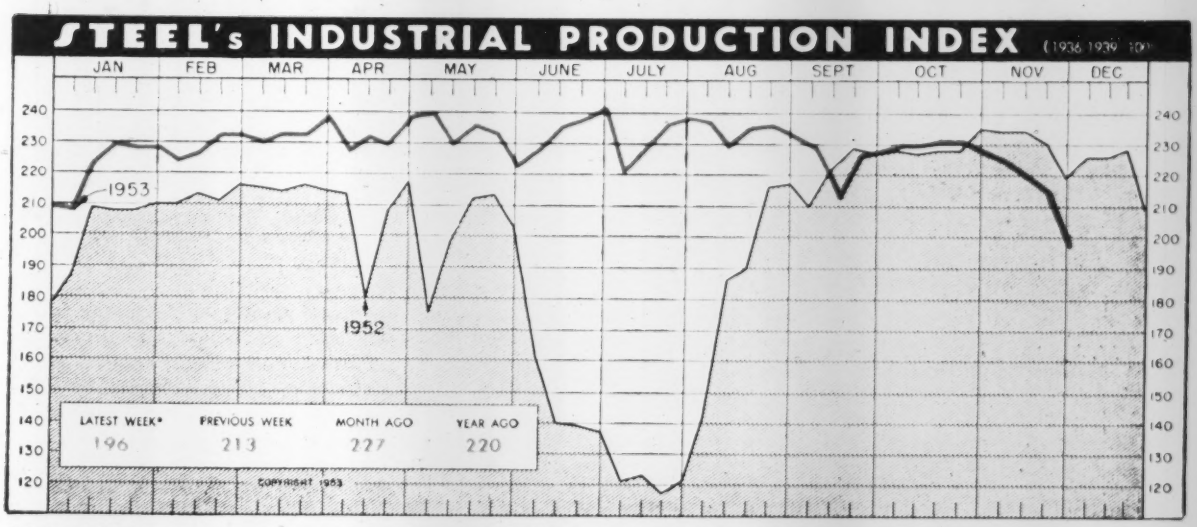
FASTER FASTENING is achieved in the Autocar plant at Ardmore, Pa., by using air tools like the one shown here to run up RB&W nuts on RB&W bolts on an Autocar truck frame. In addition to making tight, accessible joints, bolting effects substantial assembly savings.

3.1

RB&W

108 YEARS MAKING STRONG THE THINGS THAT MAKE AMERICA STRONG

Plants at: PORT CHESTER, N. Y., CORAOPOLIS, PA., ROCK FALLS, ILL., LOS ANGELES, CALIF. *Additional sales offices at:* PHILADELPHIA, PITTSBURGH, DETROIT, CHICAGO, DALLAS, SAN FRANCISCO. *Sales agents at:* PORTLAND, SEATTLE. *Distributors from coast to coast.*



*Week ended Nov. 21 Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automotive Assemblies (Wards' Reports) 20%

Industrial Production Index Hits 1953 Low

"WHAT GOES UP must always come down" has never been more apropos than during third quarter, 1953, because industrial production, which at midyear was hitting an all-time peak, has been coming down ever since. And in the holiday week ended Nov. 28, it came down with a bang.

Not since the Fourth of July week has STEEL's industrial production index taken such a slide. On a preliminary basis, the current trend line touched 196 per cent of the 1936-1939 average, down 17 points from the adjusted 213 of the previous week and below the 200 mark for the first time since the strike days of '52. But a close examination of the decline shows little reason for panic.

Too Much Turkey . . .

Biggest dip in the four elements comprising the index was in auto production, not at all unexpected. In addition to the normal Thanksgiving holiday, Chrysler Corp. and the independents took a long count on Friday, which more than offset the production at General Motors and Ford. Pontiac followed Buick and Chevrolet into the beauty shop, which offset the emergence of Mercury, Lincoln and Packard in their new looks. Oldsmobile, a hefty producer until last week, is preparing to join its GM pals in the facelifting operation, which further cuts down production. It all added up to only 74,941 units rolling off U. S. and Canadian lines, reports *Ward's Automotive Report*.

December will see a definite improvement in auto production, however, with 444,000 cars planned by U. S. producers. Considering changeovers, that will be a respectable volume.

There Shall Be Light . . .

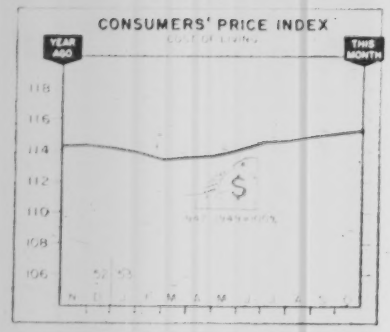
Freight car loadings also took a healthy dive over the Thanksgiving week-end, in addition to the general declines of recent weeks. And electric power, usually the bright spot in the production index, followed suit, influenced largely by automotive shutdowns.

Steel About as Expected . . .

The decrease in the steel operating rate, though accounting for a minor portion of the production index decline, is of significance. For the week ended Nov. 28, production was pegged at 86.8 per cent of capacity by American Iron & Steel Institute, or 1,956,000 net tons of ingots and steel for castings. That rate is coming close to the low of 85 per cent of capacity predicted by many experts earlier this year. Even if that mark is reached, anticipated December production will be high enough to establish 1953 as the best steel-producing year on record. AISI estimated production for the week ended Dec. 5 at the same level of the preceding week.

What Do You Read? . . .

The business picture can be good or bad, depending on what you happen to read or hear. Most production indexes, like STEEL's, are still in a downturn, although most experts hasten to add that it is a seasonal trend. Many commodity indexes also are down for recent months. For instance, shipments of steel castings in September fell below August figures by 6000 tons; factory sales of standard-size household washers in October were about 8.7 per cent beneath September figures; automatic tumbler dryers declined 5.3 per cent over the same period; October new-

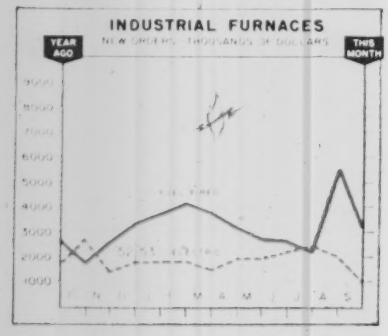


Consumers' Price Index

(1947-1949 = 100)

	1953	1952	1951
Jan	113.9	113.1	105.6
Feb	113.4	113.4	105.9
Mar	113.6	113.4	106.3
Apr	113.7	113.9	106.4
May	114.0	113.9	106.9
June	114.4	113.8	106.5
July	114.7	114.1	106.8
Aug	115.0	114.3	106.9
Sept	114.2	114.1	111.6
Oct	114.4	114.2	112.1
Nov		114.3	112.8
Dec		114.1	113.1

U. S. Bureau of Labor Statistics

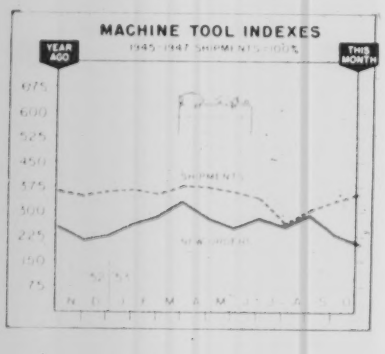


Industrial Furnaces

New Orders, Thousands of Dollars

	Fuel Fired*		Electric	
	1953	1952	1953	1952
Jan	3,340	3,379	1,655	2,506
Feb	3,906	2,413	1,672	1,363
Mar	3,607	1,813	1,301	2,100
Apr	3,917	3,606	1,706	2,258
May	2,600	3,032	1,709	3,713
June	2,500	2,954	2,005	1,552
July	2,017	6,728	2,246	2,530
Aug	1,464	4,250	1,901	1,626
Sept	3,019	2,462	873	1,412
Oct		1,067		2,459
Nov		2,382		1,241
Dec		1,250		1,934

*Except for hot rolling steel
Industrial Furnace Mfrs. Assn.

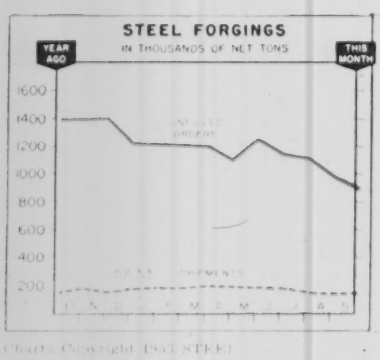


Machine Tool Indexes

1945-1947 Shipments = 100

	New Orders		Shipments	
	1953	1952	1953	1952
Jan	256.8	317.8	361.6	266.6
Feb	252.1	318.8	354.4	276.6
Mar	327.0	324.3	370.9	299.3
Apr	276.8	294.4	372.7	307.4
May	216.4	284.6	356.0	323.0
June	273.1	312.9	342.2	330.8
July	247.3	376.3	267.6	296.7
Aug	280.9	311.1	299.6	317.0
Sept	223.7	302.1	328.3	368.3
Oct	199.2	243.3	348.2	357.8
Nov		265.1		342.5
Dec		225.2		353.0

National Machine Tool Builders' Assn.



Steel Forgings*

Thousands of Net Tons

	Shipments		Unfilled Orders	
	1953	1952	1953	1952
Jan	184	271	1,207	1,472
Feb	184	277	1,199	1,464
Mar	200	266	1,197	1,360
Apr	196	277	1,082	1,348
May	191	264	1,220	1,319
June	185	224	1,155	1,248
July	166	152	1,051	1,290
Aug	141	121	974	1,300
Sept	153	130	882	1,392
Oct		178		1,304
Nov		166		1,398
Dec		180		1,377

U. S. Bureau of the Census. *Data based on reports from commercial and captive forge plants with monthly shipments of 40 tons or more.

Charts Copyright 1953 STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Nov. 30	Gray Iron Castings	Oct. 19	Ranges, Gas	Oct. 12
Durable Goods	Oct. 12	Indus. Production	Nov. 23	Refrigerators	Nov. 2
Employ., Metalwk.	Nov. 30	Ironers	Nov. 23	Steel Castings	Oct. 19
Employ., Steel	Nov. 30	Malleable Castings	Oct. 19	Steel Shipments	Oct. 12
Fab. Struc. Steel	Nov. 16	Prices, Wholesale	Nov. 30	Vacuum Cleaners	Oct. 12
Foundry Equip.	Nov. 16	Pumps	Nov. 16	Wages, Metalwk.	Nov. 9
Freight Cars	Nov. 23	Radio, TV	Nov. 23	Washers	Nov. 9
Gears	Nov. 16	Ranges, Elec.	Nov. 2	Water Heaters	Nov. 9

order index for industrial supplies and machinery went down 4.6 points from September; total net orders for industrial furnaces for 1953 through October were $53.5-million against $60.9 million for the similar 1952 period; September shipments of truck trailers totaled $23.9 million compared with $25-million in August; only 89,094 tractors (except garden type) were produced in third quarter compared with 138,581 in second quarter; $147.9 million worth of excavating and earthmoving construction equipment was produced in third quarter, off from $182.4-million in second quarter.

If you stop with those figures, the picture is bad. But many of the segments of industry represented above are putting in one of the best years on record, despite declining business now.

On the Plus Side . . .

On the plus side of the ledger you find these facts: Factory sales of household standard-size vacuum cleaners in October showed an increase over the preceding month for the third successive time; ironers sold in October were 28 per cent over September figures; the gear industry production increased by 55.7 per cent in October over September; September shipments of gray iron castings increased 33,000 tons over August; malleable iron castings business was virtually equal in September and August; manufacturers' sales increased in October over September, inventories decreased and new orders remained on an even keel. Stopping there might hide an overall slow year for some businesses.

Individuality Counts . . .

In the final analysis, it all boils down to what the indiviual company or person thinks of the picture. Most of the so-called experts in industry like what they see. The Federal Reserve Board sees 1953 setting a record gross national product of $368 billion, 5 per cent above last year. The Business Survey Committee of National Association of Purchasing Agents believes industrial business "is not too bad." It is good compared to "any normal period."

Carrying over into 1954, Westinghouse Air Brake Co. says its

BAROMETERS OF BUSINESS

	LATEST PERIOD	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	87.5	90.5	106.0
Electric Power Distributed (million kwhr)	8,138	8,416	7,701
Bitum. Coal Output (daily av., 1000 tons)	1,477	1,168	1,753
Petroleum Production (daily av., 1000 bbls)	6,250[1]	6,259	6,669
Construction Volume (ENR, millions)	$115.1	$211.7	$203.0
Automobile, Truck Output (Ward's, units)	71,941	108,252	117,315
TRADE			
Freight Car Loadings (unit, 1000 cars)	610[1]	726	670
Business Failures (Dun & Bradstreet, no.)	172	223	127
Currency in Circulation (millions)	$30,694	$30,187	$30,152
Dept. Store Sales (changes from year ago)[3]	2%	-2%	14%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,639	$20,745	$17,833
Federal Gross Debt (billions)	$275.1	$275.0	$267.2
Bond Volume, NYSE (millions)	$11.5	$16.8	$18.8
Stocks Sales, NYSE (thousands of shares)	6,028	6,720	8,112
Loans and investments (billions)[4]	$80.5	$80.5	$77.1
U. S. Gov't Obligations Held (billions)[4]	$32.6	$32.4	$31.9
PRICES			
STEEL's Finished Steel Price Index[5]	189.38	189.38	181.31
STEEL's Nonferrous Metal Price Index[6]	206.7	206.8	213.2
All Commodities[7]	110.0	109.8	110.7
Commodities Other Than Farm & Foods[7]	114.6	114.6	112.8

[1]Data on request. [2]Preliminary. [3]Weekly capacities, net tons. [4]Dec. 2,254,439; 1952, 2,077,000. [5]Federal Reserve Board. [6]Member banks, Federal Reserve System. [7]1935-1939 = 100. [8]1926 Base = 100. [9]Bureau of Labor Statistics Index, 1947-1949 = 100.

sales should increase to more than $160 million compared with about $144 million this year. A panel of three tool and die manufacturers told Central Connecticut Tool & Die Industries that the industry can look forward to 1954 with optimism. Jack Kleinoder, general manager of John Volkert Metal Stampings Inc., Queens Village, N. Y., said, "In the highly competitive market there will be no place for mediocre tooling. Management and facilities must be geared to this better type tooling."

One of the most optimistic forecasts yet made public comes from Prudential Insurance Co. of America, which predicts next years' gross national product will be in the neighborhood of $369 billion, although not all segments of business will follow this year's pattern. A sharp increase in consumer buying would offset some other decreases, the company said.

Christmas Spirit Lags . . .

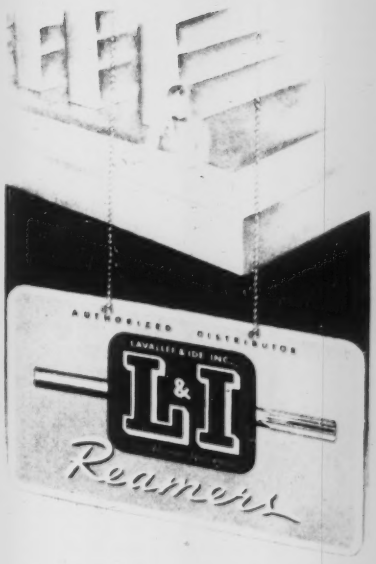
Many businessmen wish that some of that increased consumer buying were going on now. Federal Reserve Board reports that for the week ended Nov. 21, department store sales sagged 2 percentage points beneath the corresponding week a year ago. The year through Nov. 21 is still ahead of the same interval in 1952 by about 2 per cent, however.

Not What It Used To Be . . .

Merchants have some cause to wonder about Christmas sales. The consumer's money isn't going as far today as it did yesterday. Using the 1939 dollar as 100 cents, the purchasing power of October's dollar was only 55 cents compared with 55.6 cents a year before. And with cost of living still going up, it may be worth less today. Bureau of Labor Statistics, Department of Commerce, announces the consumer price index for October rose 0.2 per cent over September, resulting in more pay in envelopes of workers whose wages are tied to the index. The government says the peak is reached in cost of living, but it is not so evident to John Q. Public.

Trends Fore and Aft . . .

In the Commerce department's 1952 Annual Survey of Manufactures, it is revealed that of the estimated 267,600 manufacturing plants in the U. S. last year, metalworking accounted for 54,655 of them . . . The same survey shows that metalworking accounted for $49.8 billion of the $108.5 billion value added by manufacture.



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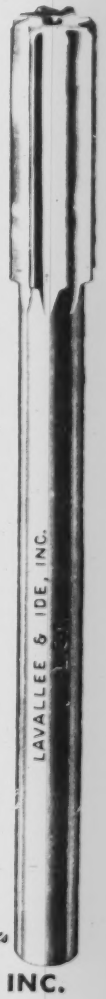
is your guarantee of top performance ..in a reamer ...in a distributor.



L&I *The Reamer Specialists*

LAVALLEE & IDE, INC.
CHICOPEE, MASS.

Users report excellent results with New Sunicut S Oils

In just six months, these unique new straight cutting oils have "Job Proved" themselves as top performers in many metalworking shops all through the industry.

Reports like these keep coming in:

AN AUTO PARTS MANUFACTURER INFORMS US, "Threaded parts are as much as 50° cooler when they come off the machines. And our operators like the clear, clean, odorless qualities of Sunicut 102-S."

SCREW MACHINE SHOPS REPORT, "The versatility of Sunicut 209-S permits us to reduce the number of oils we must stock."

BROWN & SHARPE SCREW MACHINE OPERATORS SAY, "Sunicut 11-S increases tool life, gives finer finishes, eliminates staining problem."

LARGE IMPLEMENT MANUFACTURER TELLS US, "We get better finishes in our broaching operations with Sunicut 110-S, and our operators favor its light color."

Let us show you how these new Sunicut S Oils can help you. For technical bulletins or the services of a Sun representative, call your nearest Sun office or write SUN OIL COMPANY, Philadelphia 3, Pa., Department S-12.

INDUSTRIAL PRODUCTS DEPARTMENT

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F. W. WEHRHEIM
. . . *Appleton Electric v. p.-sales*

F. W. Wehrheim was elected vice president-sales, **Appleton Electric Co.**, Chicago. He succeeds **E. A. Murray**, resigned to return to U. S. Steel Corp.'s American Steel & Wire Division. **I. W. Strong**, former Denver sales representative, was made assistant to the vice president-sales.

Fred N. Eaton was appointed works manager of the foundry division of **Aluminum Industries Inc.**, Cincinnati. For the last 25 years he has been with Bohn Aluminum & Brass Corp., most recently serving as manager of its foundry division.

Ellsworth M. Smith, formerly chief metallurgist of Beryllium Corp., was named vice president and chief metallurgist of **Penn Precision Products Inc.**, Reading, Pa.

Richard L. Allen replaces the late **Chester M. Adams** as general sales manager, **Bridgeport Brass Co.**, Bridgeport, Conn. He has served as assistant sales manager since 1950.

Vanadium - Alloys Steel Canada Ltd., London, Ont., announces resignation of **Jean P. Elkann** as president and election of **James P. Gill** to that position. Mr. Gill is executive vice president of the parent company, Vanadium - Alloys Steel Co., Latrobe, Pa.

A. L. FOSCUE
. . . *heads Union Carbide divisions*

A. L. Foscue was elected president, **Electro Metallurgical Co.** and **United States Vanadium Co.**, divisions of Union Carbide & Carbon Corp., New York. He succeeds **Walter E. Remmers**, now chairman of both divisions and also a member of the corporation's appropriations committee.

John E. Carroll, former vice president-sales, was elected president of **American Hoist & Derrick Co.**, St. Paul. He succeeds **Harold O. Washburn**, now chairman of the board. **James F. Bishop** was elected vice president-treasurer.

JOHN E. CARROLL
. . . *new president of American Hoist*

FRANK WATT
. . . *promoted by Frederic B. Stevens Inc.*

Frank Watt is the new general sales manager for the metal finishing and foundry divisions, **Frederic B. Stevens Inc.**, Detroit. He has been sales manager for the metal finishing division and is replaced by **Guy Cummings**. **Clair Crawford** was named sales manager for the foundry division. **Ralph L. Eastman** is consultant on all metal finishing operations. **Durwood J. Swaninger** was named sales manager of buffing compositions, and **Dr. J. A. Ridderhof** is manufacturing manager and director of research for the foundry facing and buffing composition departments.

Eastern Tool & Mfg. Co. Inc., Lancaster, N. Y., appointed **Rudolph C. Kraemer** sales manager.

Morgan Ricks was made midcontinent division manager for the **Colona Mfg. Division**, Pittsburgh Screw & Bolt Corp. He will have headquarters in Tulsa, Okla. Associated with the company in a sales capacity for the last 15 years, Mr. Ricks was district manager of the Louisiana division with offices in Baton Rouge, La.

Acme Steel Products Division Acme Steel Co., appointed **Roy C. Camp** southeastern district sales manager and **Dan C. Jorgensen** special sales representative for the southern area. Mr. Camp replaces

ROBERT T. COLLINS
New Departure gen. sales mgr.

M. E. DORMAN
materials mgr. at Bliss' Canton div.

CHARLES W. PUNTON
Mine Safety Appliances engineering dir.

Robert Lammers, transferred to the company's general offices in Chicago as sales manager of Steelstrap. Mr. Jorgensen takes over duties formerly handled by Mr. Camp. Both men will headquarter at East Point, Ga.

Robert T. Collins was named to succeed **Charles D. McCall** as general sales manager of General Motors Corp.'s **New Departure Division**, Bristol, Conn. He formerly was Meriden, Conn., plant manager for the division. Mr. McCall fills a new position as manager of automotive engineering within New Departure's engineering department.

A. M. Miers succeeds the late **Roy F. Johnson** as manager of **Pullman-Standard Car Mfg. Co.'s** sales and service engineering division, Chicago.

F. Q. Wilson was appointed New York district manager of **Elliott Co.** He has been in charge of the Cincinnati office since 1947.

M. E. Dorman was made manager of materials for the Canton, O., division of **E. W. Bliss Co.** In addition to supervision of the purchasing department, Mr. Dorman will be in charge of inventories, stores and receiving operations. He was previously purchasing manager for the Hastings, Mich., and former Brooklyn, N. Y., divisions.

Arthur C. Engh, former sales manager of pig iron and chemicals for Inland Steel Co., is now associated with **Universal Sheet & Strip Steel Co.**, Chicago, as a special representative. He had been with Inland Steel for about 40 years.

Newly elected directors of **American Locomotive Co.**, New York, are **Henning W. Prentis Jr.**, chairman of Armstrong Cork Co., and **Col. Willard F. Rockwell**, chairman of Rockwell Mfg. Co.

Mine Safety Appliances Co., Pittsburgh, appointed **Charles W. Punton** director of engineering. Associated with the company since 1929, he has been works manager since 1941.

Clarence H. Smith was named general superintendent of the South Bend, Ind., **Studebaker Co.** plant to succeed the late **George E. Wesphal.**

Virgil P. Poleos will represent **S-P Mfg. Corp.** in California and Arizona. He has his office in Los Angeles.

Joseph C. Anton is superintendent of construction at the Indiana Harbor plant of **Youngstown Sheet & Tube Co.** at East Chicago, Ind. He was appointed to succeed **Ed Haak**, retired.

James R. McBrien, assistant division manager of **Diversey Corp.'s** eastern division since 1949, was promoted to manager of the north central division with headquarters in Minneapolis.

F. T. Benjamin, Chicago district manager for **Columbus McKinnon Chain Corp.** and its Chisholm-Moore Hoist Division, was advanced to manager of field sales in the Tonawanda, N. Y., home office. **Karl L. Miller** is his successor and assumes the title of regional sales manager.

Richard I. Kern was appointed western manager of **Miniature Precision Bearings Inc.** with headquarters at the company's new plant at Santa Barbara, Calif.

H. Clay Davis was made manager of sales of coke and coal chemicals for **Woodward Iron Co.**, Birmingham.

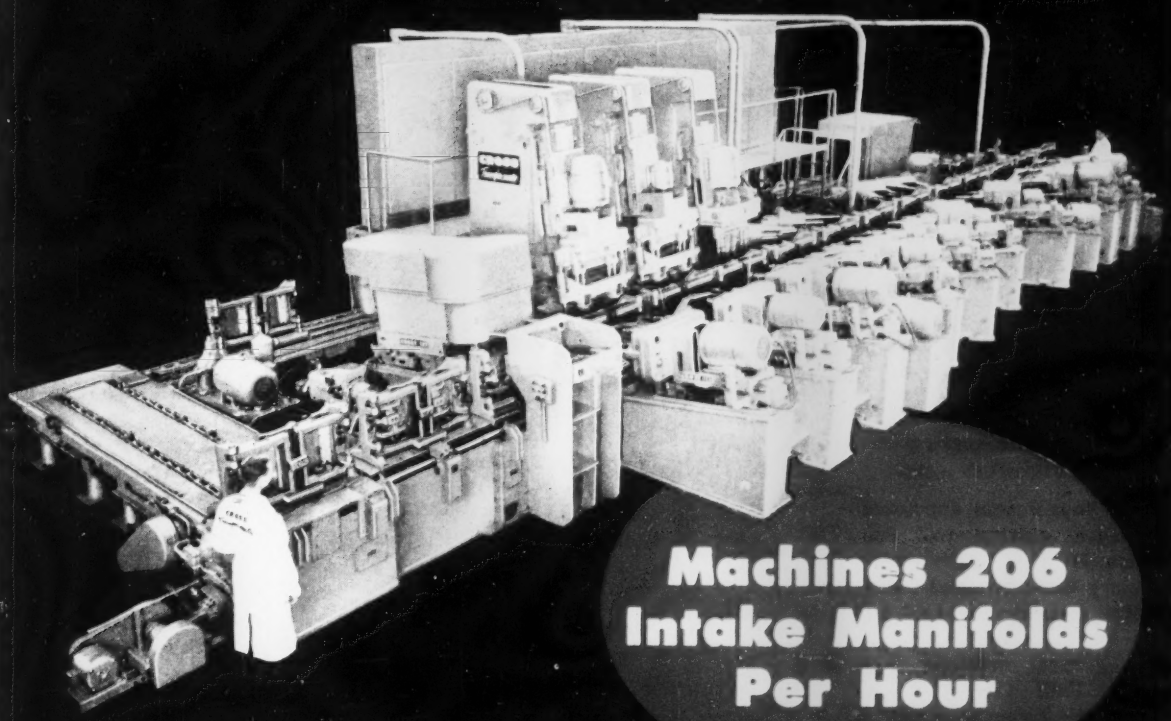
B. A. Kline was appointed sales manager, **Birdsboro Steel Foundry & Machine Co.**, Birdsboro, Pa. He has been assistant to the vice president and will continue to discharge the duties of that position.

Ray H. Scheurer is sales representative for **Midvale Co.** in the Cleveland territory.

Caterpillar Tractor Co., Peoria, Ill., transferred **H. J. Hunkele** to the engine division as assistant manager, industrial sales. He is replaced as assistant sales manager of the central sales division by **E. A. Tiarks.**

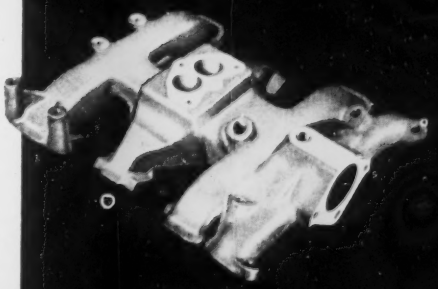
Carl Gustafson was appointed director of mechanical maintenance for **Colorado Fuel & Iron Corp.** In addition he continues as superintendent of the mechanical de-

Another Transfer-matic by Cross



Machines 206 Intake Manifolds Per Hour

- ★ Two parts machined at one time in each station.
- ★ 100 operations—two milling, 48 drilling, four boring, 20 chamfering, four spotfacing, and 22 tapping.
- ★ 14 stations—one loading, one unloading, 12 working.
- ★ Palletized work holding fixtures with power wrenches for automatic clamping.
- ★ Integral conveyor for automatic return of palletized fixtures from unloading to loading station.
- ★ Other features—automatic chip removal; hardened and ground ways; automatic lubrication system; J. I. C. standard construction.



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THE CROSS CO.

DETROIT 7, MICHIGAN

Special MACHINE TOOLS

A. J. SNYDER
. . . Motch & Merryweather div. sales mgr.

WALTER E. FORAKER
. . . Chrysler organization manager

FRED MACKEY
. . . adds to duties with A. O. Smith

partment at the corporation's Pueblo, Colo., plant.

A. J. Snyder was appointed sales manager, cutting tool sales division, **Motch & Merryweather Machinery Co.**, Cleveland. A veteran in the metalcutting tool industry, he was formerly vice president and general manager of Morse Twist Drill Co., New Bedford, Mass. He recently served the government as chief of the cutting tool section, Metalworking Equipment Division, National Production Authority.

R. E. Stacy was made assistant metallurgical engineer, **Bethlehem Pacific Coast Steel Corp.**, Los Angeles plant.

John F. Lampe, formerly sales manager of M. B. I. Export & Import Co., has joined the machine tool division of **Kurt Orban Co. Inc.**, New York. He will represent Orban in eastern Pennsylvania and southern New Jersey.

George F. McDonald and **V. J. Hornak** joined the Los Angeles sales staff of **L. B. Foster Co.**

Marshall Pengelly was made assistant superintendent in charge of structural fabrication and warehousing at **Elizabeth Iron Works**, Elizabeth, N. J.

Noel Lee was made manager of Canadian sales and service for **Yale Rubber Mfg. Co.** He will have offices at Kitchener, Ont.

Walter E. Foraker was made organization manager, **Chrysler Division**, Chrysler Corp., Detroit. With Chrysler Corp. since 1934, he has been director of distribution for Dodge Division since 1950.

Joseph J. Schaefer and **Francis B. Bryant** are new sales engineers in **Udylite Corp.'s** Chicago regional sales office.

Allen D. Foote is works purchasing agent, West Allis Works, **Allis-Chalmers Mfg. Co.**, Milwaukee.

Permutit Co., New York, promoted **Felix W. Saco** to development engineer, a newly created post. He joined the company in 1952, assigned to the mechanical engineering department.

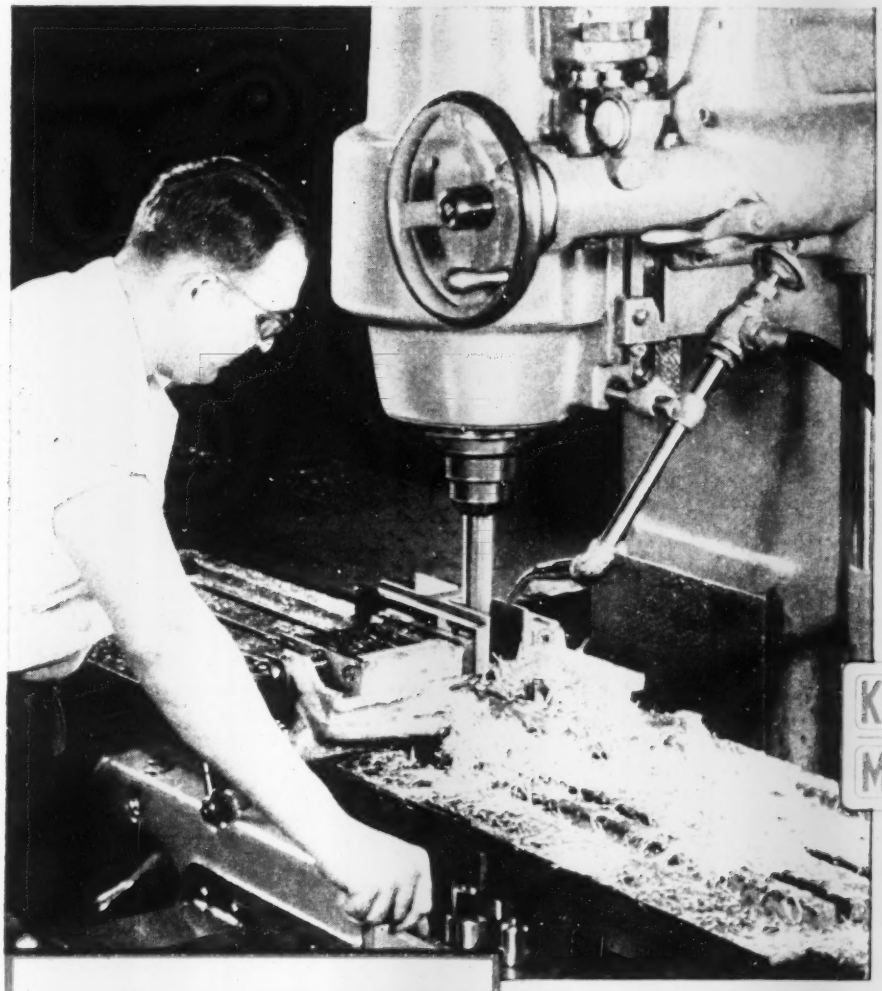
FELIX W. SACO
. . . Permutit development engineer

Fred Mackey, who holds the title of vice president in charge of manufacturing for **A. O. Smith Corp.**, returns to Milwaukee headquarters to assume larger responsibilities in administering company-wide manufacturing problems. Mr. Mackey, who joined the company about a year ago after association with Allis-Chalmers Mfg. Co., has been directing defense goods production and has been located at the Landing Gear Division at Toledo, O., dividing his time between that activity and the Airframe Division at Rochester, N. Y. **F. S. Cornell**, vice president-general manager of A. O. Smith, becomes a member of the central staff on Mr. Mackey's staff. **Arnold J. Ristow**, who has been managing the Rochester plant, also returns to Milwaukee to join Mr. Mackey. He is replaced by **Willard L. France**, formerly a consultant at Rochester.

Hewitt-Robins Inc., Stamford, Conn., elected **Ellis B. Gardner** and **Robert A. Nilsen** vice presidents. Mr. Gardner since 1950 has been controller, and Mr. Nilsen is general manager, foam rubber division.

Colorado Fuel & Iron Corp. organized a department to co-ordinate and expand product research and development. As part of the executive department, the new unit will headquarter at Washington under the direction of **Howard J. Davis**, assistant to the president. In addition, Mr. Davis continues as the corporation's Washington repre-

Load, engage feed and unload — that's all there is to it with this CH miller!



HERE ARE THE JOB FACTS

Co.: Aeroaffiliates, Inc., Fort Worth, Texas

Machine: 10 hp, No. 3 Model CH Vertical Milling Machine

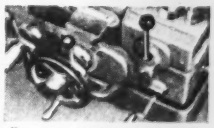
Depth of cut: 2 inches

Feed rate: 6⅛ ipm

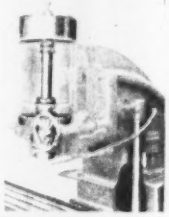
Cutter: 4-lip HSS 1¼ inch end mill

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

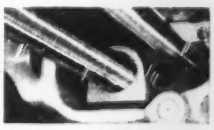
CH Milling Machine features that helped increase output — cut cost per piece



Greater operating convenience through Mono-Lever control (optional) for table feed and rapid traverse.



Greater Cutting Efficiency through spindle mounted flywheel, (optional), running with three bearing support.



Smoother Feed Performance through large dia. heavy duty table feed screw that affords greater bearing contact. All models are equipped with a back-lash eliminator.

Aeroaffiliates of Texas select Kearney & Trecker 10 hp No. 3 Model CH Vertical Milling Machine with *Mono-Lever and Automatic Cycle Table Control*, to speed milling of aircraft parts and reduce operator fatigue!

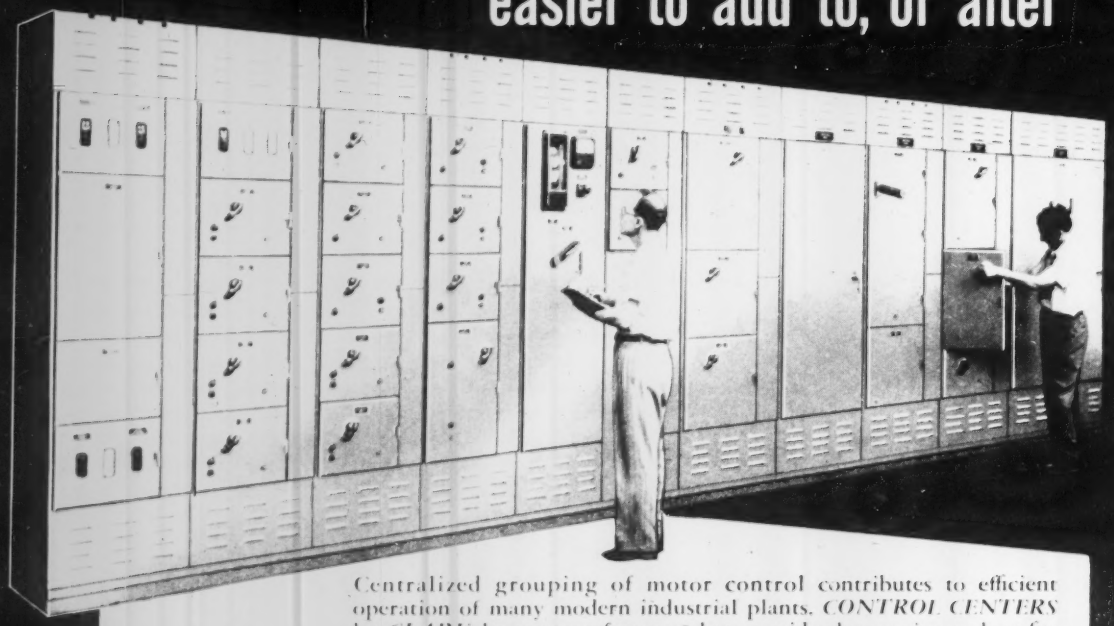
TO finish-mill aluminum vertical beam fittings, this manufacturer put production on an almost automatic basis without sacrificing accuracy. He's handling the job on a 10 hp, No. 3 CH Vertical Milling Machine equipped with Mono-Lever and Automatic Cycle Table Control.

Now, after the original setup, all the operator does is load the machine, engage the feed and unload. Production is up, accuracy is maintained and operating conditions have been greatly improved due to the reduction in operator fatigue.

Check this great CH line of machines for yourself. See how you, too, can cut costs, increase productivity, improve safety, get better finished products. Contact our representative or write Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee 14, Wisconsin.

CLARK CONTROL CENTERS

are *easier to install* easier to service easier to add to, or alter



Centralized grouping of motor control contributes to efficient operation of many modern industrial plants. *CONTROL CENTERS* by *CLARK* have many features that provide the maximum benefits obtainable. For example:

Separately enclosed 6-inch wide vertical wireways for each vertical section are accessible without opening compartment doors. This feature means easier installation and maintenance.

Safe-edge compartment doors eliminate dangerous sharp edges and corners. Door handles are interlocked with disconnect switches or circuit breakers.

Frame is rigidly constructed in double-box style, of sturdy welded channel sections, capable of withstanding heavy blows without destroying alignment.

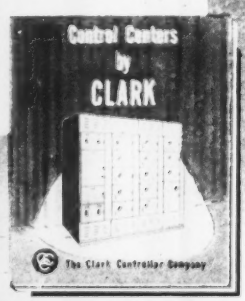
All Control Equipment is accessible and removable from front. Connections and wiring are all done from the front, and all equipment is accessible without removal from compartment.

Each compartment is an integral unit, independent from frame and, in practically all sizes, is completely removable, with plug-in connections. This provides maximum flexibility.

Uniform neat appearance of compartments, in a complete range of sizes, permits an almost infinite variety of combinations.

In NEMA Type C construction, Clark Control Centers permit terminals to be located in top and/or bottom or in vertical wireways.

The use of standard factory-assembled components throughout eliminates special engineering, saves time and money in installations.



CONTROL CENTERS by CLARK, are completely CLARK designed, CLARK engineered and CLARK built, for continuing reliability and uniformity.

Send for your copy of the factual book "Control Centers by Clark".

ENGINEERED ELECTRICAL CONTROL

THE CLARK CONTROLLER CO.

1146 EAST 152ND STREET, CLEVELAND 10, OHIO

ROY W. VORHEES
. . . new supervisory post at Dodge

JOHN M. MORRIS
. . . Lone Star Steel purchasing director

PAUL GALTON
a Worthington Corp. sales mgr.

sentative for all activities excepting sales.

Roy W. Vorhees was appointed to the newly created post of supervisor of product planning and estimating for **Dodge Division**, Chrysler Corp., Detroit. He was formerly factory manager of the Detroit Plymouth Division plant.

Michael Darkoch was named superintendent of warehousing for the Pittsburgh district of **L. B. Foster Co.** Prior to joining Foster he was general foreman of Pittsburgh-Des Moines Steel Co. and associated with that firm for 17 years.

Rotary Electric Steel Co. appointed **W. N. McArdle** Chicago district sales manager. He was formerly vice president of Associated Steel Mills Inc., St. Louis.

C. Paul Huge was appointed vice president-sales manager, **Chicago Decorating Co.**, Chicago. **David L. Kuhlman** was made general manager.

John M. Morris replaces **G. C. Graves** as director of purchasing, **Lone Star Steel Co.**, Lone Star, Tex. He transfers to the firm's E. B. Germany Works from the Dallas office where his most recent assignment was in the procurement division. Mr. Graves was made industrial relations manager for the Germany Works and will report to L. D. Webster, vice president of employee and public relations.

L. A. Kilgore was appointed staff engineering manager for **Westinghouse Electric Corp.'s** East Pittsburgh, Pa., divisions.

Richard M. Vail became sales manager of **Drake Steel Supply Co.**, San Diego, Calif., as of Nov. 17.

Francis T. Tarone is now affiliated with **D. C. Latella & Associates**, Philadelphia.

J. S. Spear heads the newly established sales office in San Francisco for **Sarco Co. Inc.**

Worthington Corp., Harrison, N. J., appointed **Paul Galton** manager of its welding and positioning equipment sales division. For the past several years he was sales manager, Central Transformer Corp., Pine Bluff, Ark.

Charles M. Offenhauer was named assistant manager, **Metals Research Laboratories**, Niagara Falls, N. Y., to succeed **Joseph R. Dawson**, retired. The laboratories perform all metallurgical research for Electro Metallurgical Co. and some research for other divisions of Union Carbide & Carbon Corp. Other recent appointments to Metals Research staff include **James H. Downing, Raymond Gillespie, John H. Haglund, Emmy M. Modl, Erich K. Modl, Robert S. Shoemaker** and **Richard Crago**.

Peyton L. Morgan Jr. was appointed southern district engineer for the air appliance division, **U. S. Hoffman Machinery Corp.**, New York.

OBITUARIES . . .

James D. Clarke, 61, president and treasurer, **Eastern Tool Co.**, Springfield, Mass., died Nov. 23.

William T. Coholan, 68, manager of steel sales for **Stanley Works**, New Britain, Conn., for 36 years, died Nov. 26.

Charles J. Koch, 49, manager since 1947 of engineering, medium induction motor department, **General Electric Co.**, Schenectady, N. Y., died Nov. 21.

John T. Jones, 35, connected with the sales department of **Vesuvius Crucible Co.**, Pittsburgh, for five years, died Nov. 22 in Minneapolis.

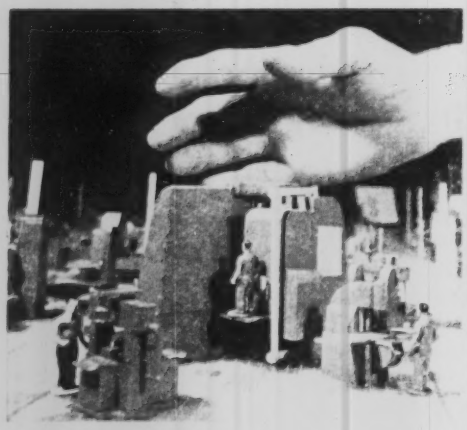
Andrew H. Kean, 66, sales representative with **Edward A. Lynch Machinery Co.**, Wynnewood, Pa., died Nov. 16.

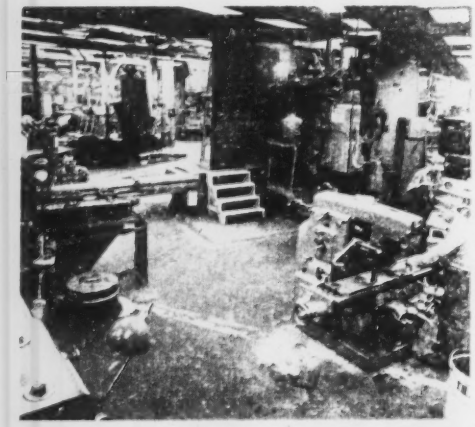
C. S. McReynolds, 58, owner of **McReynolds Tool & Die Co.**, Detroit, died Nov. 23.

Herman J. Laurent, order department manager, **Wyckoff Steel Co.**, Pittsburgh, died Nov. 18.

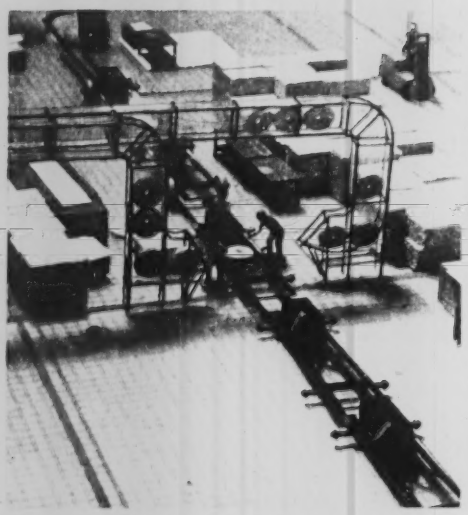
Ellsworth B. Gitchell, 47, production analyst, **Northrop Aircraft Corp.**, Los Angeles, died Nov. 14.

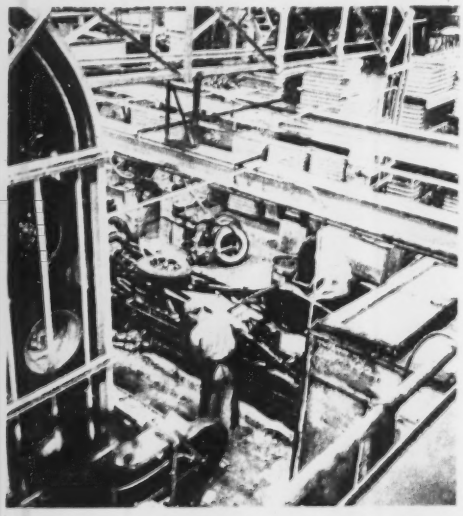
3-D Planning Helps Solve Auto Assembly Line Puzzles





Models prove themselves in practice for General Motors Corp. plant layout designers





Models show that three machines can go in space allowed for two

Co-ordination of chassis line and wheel drop is easier with 3-D model

Black Star

Touch-up line as seen in model looks almost like the actual touch-up line

Less Smoke at Monessen

Pittsburgh Steel co-operates with a civic campaign to help reduce air pollution 23 per cent

SMOKE CONTROL is a civic function at Pittsburgh Steel Co.'s Monessen, Pa., Works. Since 1951, when a complete air cleanliness laboratory was set up, amount of solid material in the air at Monessen has been cut by 23 per cent.

Steelmakers at Monessen have spent over $4.3 million in the past three years for new facilities contributing directly or indirectly to cleaner air. Recently the No. 3 blast furnace returned to operation with new gas cleaning equipment costing $132,000. This equipment electrostatically removes dust particles from discharge into the air. Some $250,000 was invested in new slag handling methods which prevent release of fumes or obnoxious odors during the granulating process.

Please the Public—City officials of Monessen are keenly interested in Pittsburgh Steel's smoke control program. The clean-air campaign is still under way, the company reported to Mayor Hugo Parente and city council members.

When a Monessen housewife complains of a heavy sootfall, Pittsburgh Steel's new mobile unit hurries to that area. This two-man team secures and analyzes air samples, measures quantities of gas in the air, determines wind direction and velocity and barometric pressure. Their findings determine when certain fumes are released by Pittsburgh Steel.

"Instrument testing has shown no evidence that gases harmful to health or plant life are released from the Monessen Works," Ken Maxey, public relations manager, stresses. "We are stepping up our air cleanliness program for civic and plant betterment."

Improvements — Looking ahead, Pittsburgh Steel plans to install a new turboblower early next year at Monessen. It will contribute to cleaner air by maintaining a constant blast in the furnaces, eliminating pulsations that contributed to furnace "slips."

Aside from bettering community relations, improvements are providing concrete savings for Pittsburgh Steel. Blast furnace smoke, for example, is now diverted to a mixing station for subsequent use in heating operations.

Gleason Building Foundry

Gleason Works, Rochester, N. Y., is constructing a $5-million foundry which will boost the plant's capacity by 50 per cent. The new building will contain about 140,000 sq ft of floor space. Layout will provide straight-line flow of work, utilizing various types of automatic coremaking and molding machinery, tunnel conveyors for core and mold drying and a completely automatic system of sand handling and conditioning. The old foundry will continue in use until the new one is finished in 15 or 18 months.

Bridgeport Brass Opens Office

Bridgeport Brass Co., Bridgeport, Conn., opened a sales office in the Federal Square building, Grand Rapids, Mich. The office is under the direction of Thomas H. Williams.

Beryllium Corp. Names Agent

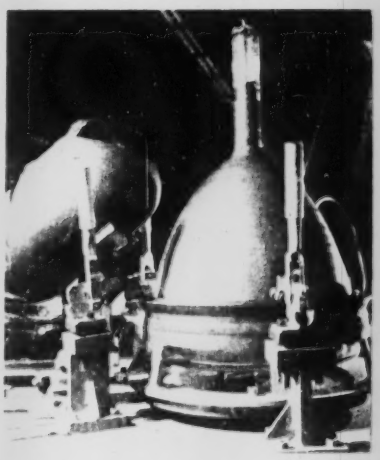
Beryllium Corp., Reading, Pa., appointed Eastern Metal Mill Products Co., Boston, as its distributor in the area. Eastern's stocks include beryllium-copper strip and rod. Slitting facilities are offered for customer convenience.

New Firm To Make Instruments

National Production Services Inc. has been incorporated in Dayton, O., to manufacture tools, jigs, instruments and related products. Principals are Joseph A. Williams, George H. Strickland and James T. Lynn.

Tomlinson Heads Association

R. F. Tomlinson, manager, conveyor department, Oliver Corp., A. B. Farquhar Division, York, Pa., was elected president of the Conveyor Manufacturers Association, Washington. He succeeds Harry C. Davis, general manager, Kanawha Mfg. Co., Charleston, W. Va. Jervis C. Webb, president, Jervis B. Webb Co., Detroit, was elected vice president; E. E. Boberg, sales manager, Standard Conveyor Co., North St. Paul, Minn., treasurer; Russell B. Maas, president, Screw Conveyor Corp., Hammond, Ind., secretary.



Wide World

Color TV on Way

Protected by a mask, a technician at RCA's plant in Lancaster, Pa., joins a tri-color television picture tube's faceplate to the main cone. The operation insures a rugged, air-tight seal essential for color-image reception

Skil Moves Branch Offices

Skil Corp., Chicago, manufacturer of portable electric and pneumatic tools, moved four of its branch offices to new locations. The new offices are located at 2800 Park Ave., New York; 2323 Greenmount Ave., Baltimore; 5616 N. E. Glisan St., Portland, Oreg.; 1620 E. Riverside Dr., Indianapolis.

Operates New Coke Ovens

Semet-Solvay Division, Allied Chemical & Dye Corp., New York, announced completion of a battery of 76 Wilputte coke ovens, including coal handling and by-product facilities, at its Ashland, Ky., Works. Designed and built by Semet's affiliate, Wilputte Coke Oven Division, the vertical-flue underjet ovens started operation Nov. 24.

The increased amounts of coal necessary to charge the ovens are handled by a new, automatic coal preparation system. Capable of handling 350 tons of coal per hour, this system mixes the coal, pulver-

izes it, and carries it by conveyors to the oven storage bins which retain the coal until it is loaded into larry cars for charging the ovens.

Landis Observes 50th Year

Landis Machine Co., Waynesboro, Pa., is commemorating its 50th anniversary this year with publication of a booklet entitled *Landis Men and Machines*. It outlines the history of the organization from 1887 when A. B. Landis, then employed by Geiser Mfg. Co., conceived and developed his first thread cutting die head. This die head employed a tangential chaser which, while representing a radical departure from the then accepted design for thread chasers, constitutes a basic design principle from which the firm has never departed. Landis Machine Co. began operations with five employees in 1903 in a building having 7600 sq ft of floor space; today, the plant covers over 350,000 sq ft of floor space with employment of 956.

Opens Electronics Laboratory

Electronics Division of Diamond Power Specialty Corp., Lancaster, O., opened its new electronics laboratory which is adjacent to the manufacturing plant. The laboratory is being used for developing electronic instruments and controls.

Brass Foundry Organized

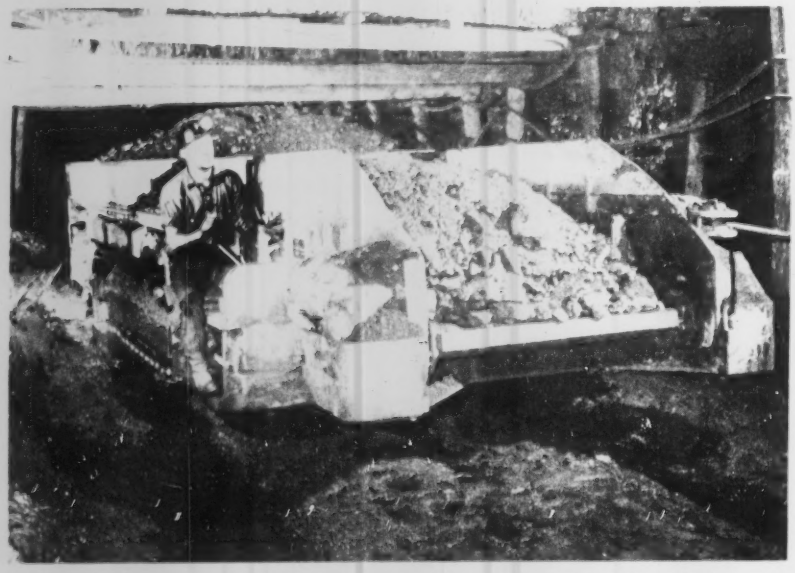
Kessler's Brass Foundry Inc. was organized in Huntington, W. Va. Members of the board of directors are W. P. Kessler, president and general manager; Henry A Moore, vice president, treasurer and sales manager; Harry W. Morris, secretary.

Plans To Make Shears

Curry Air Shear Corp. was established with headquarters in the Oliver building, Pittsburgh. The firm will manufacture air-operated shears for use in the steel and general manufacturing industries. Officers are Albert Curry Jr., president, and Thomas B. Hudson Jr., vice president.

Plasteel Offers New Product

Plasteel Products Corp., Washington, Pa., is marketing a protected metal roof deck for heavy industry. The newly developed deck is manufactured by a special process that combines the structural strength of steel with three protective coatings: A bond coat, a weather-sealed asphaltic plastic coating and mica topping.



G-E Shuttle Car Solves Soft Bottom Mine Conditions

Shuttle car, shown above, made by General Electric Co., Schenectady, N. Y., proved ideal for wet bottom conditions of Jamison Coal & Coke Co.'s Mine 21 at Hostetter, Pa. It hauls seven to nine tons of coal per day over a perpetually wet floor by means of its caterpillar tracks. Wheeled vehicles bog down

Jenks Made Institute Trustee

Kenneth U. Jenks, secretary and controller of Lindberg Steel Treating Co., Melrose Park, Ill., was elected a trustee of the Metal Treating Institute, New Rochelle, N. Y.

Blaw-Knox Offers New Service

Blaw - Knox Co., Pittsburgh, through its Chemical Plants Division, offers to petroleum refiners the design and construction of continuous coking units by arrangement with Standard Oil Development Co., owner of the fluid-coking process.

Scully-Jones Names Agents

Scully-Jones & Co., Chicago, named seven stocking distributors in Michigan. These firms will carry stocks of Scully-Jones precision tools: Bobier Tool Co., Flint; Industrial Equipment & Supply Co., Benton Harbor; Grand Rapids Supply Co., Grand Rapids; Kendall Hardware-Mill Supply Inc., Kalamazoo; Sturm Tool Supply Co., Lansing; Lakeshore Machinery & Supply Co., Muskegon; Mahar Tool Supply Co., Saginaw.

Servomechanisms Expands

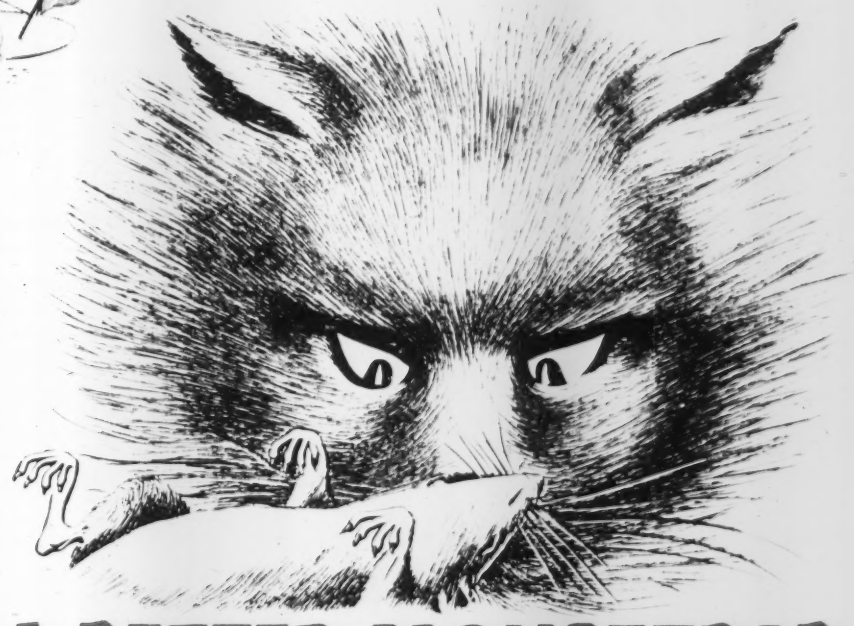
Servomechanisms Inc., Garden City, N. Y., formed a Component Division with headquarters at 625 Main St., Westbury, Long Island, N. Y. This division will produce miniature motors, mechanical development apparatus and other products associated with the electronic and instrument industries. R. F. Redemske, vice president, is division manager.

De Havilland To Operate Plant

Canadian General Electric Co. has resigned as operator-manager of the government's jet engine repair and overhaul plant near Toronto, Ont. Canadian government is negotiating with De Havilland Aircraft of Canada Ltd., Toronto, to take over the plant Jan. 1. Defense Production Department in Ottawa announced Canadian General Electric's decision, arising from government policy to concentrate on production of the all-

(*Please Turn to Page* 119)

THE BURLINGTON LIARS' CLUB
SPINS A YARN FOR BAKER'S MAGDOLITE



BUILT-A BETTER MOUSETRAP

Tabby lived and hunted in a mill overrun with mice. Apparently, however, the mice were very smart because Tabby never caught any. Then, one day, he accidentally lost a front paw in the machinery. Feeling sorry for Tabby, one of the workers whittled him a peg-leg. Soon, he began to bring in mice by the dozens!

Investigating, the worker found that Tabby hid behind a post in the store room. From trying to look around both sides of the post at the same time, he had become crosseyed, a circumstance which threw the mice off guard. When they thought—by watching Tabby's eyes—that he was looking elsewhere, they would venture out of their holes. Still watching his eyes, they would come closer and closer until they were within his reach. And then Tabby would let go a haymaker with his wooden leg and club them to death!

The J. E. Baker Company didn't build a better mousetrap, but it did discover, years ago, how to make a better dolomite. Through continued research, BAKER'S MAGDOLITE, the original dead-burned dolomite, was developed. Constantly improved through the years, BAKER'S MAGDOLITE, with its superior chemical, physical, mineralogical composition and its properly burned grain-size particles, delivers more uniform ingots with less defective production material.

Try BAKER'S MAGDOLITE today! See for yourself why it's always 5 ways better: Composition, Preparation, Strength, Economy, Quality.

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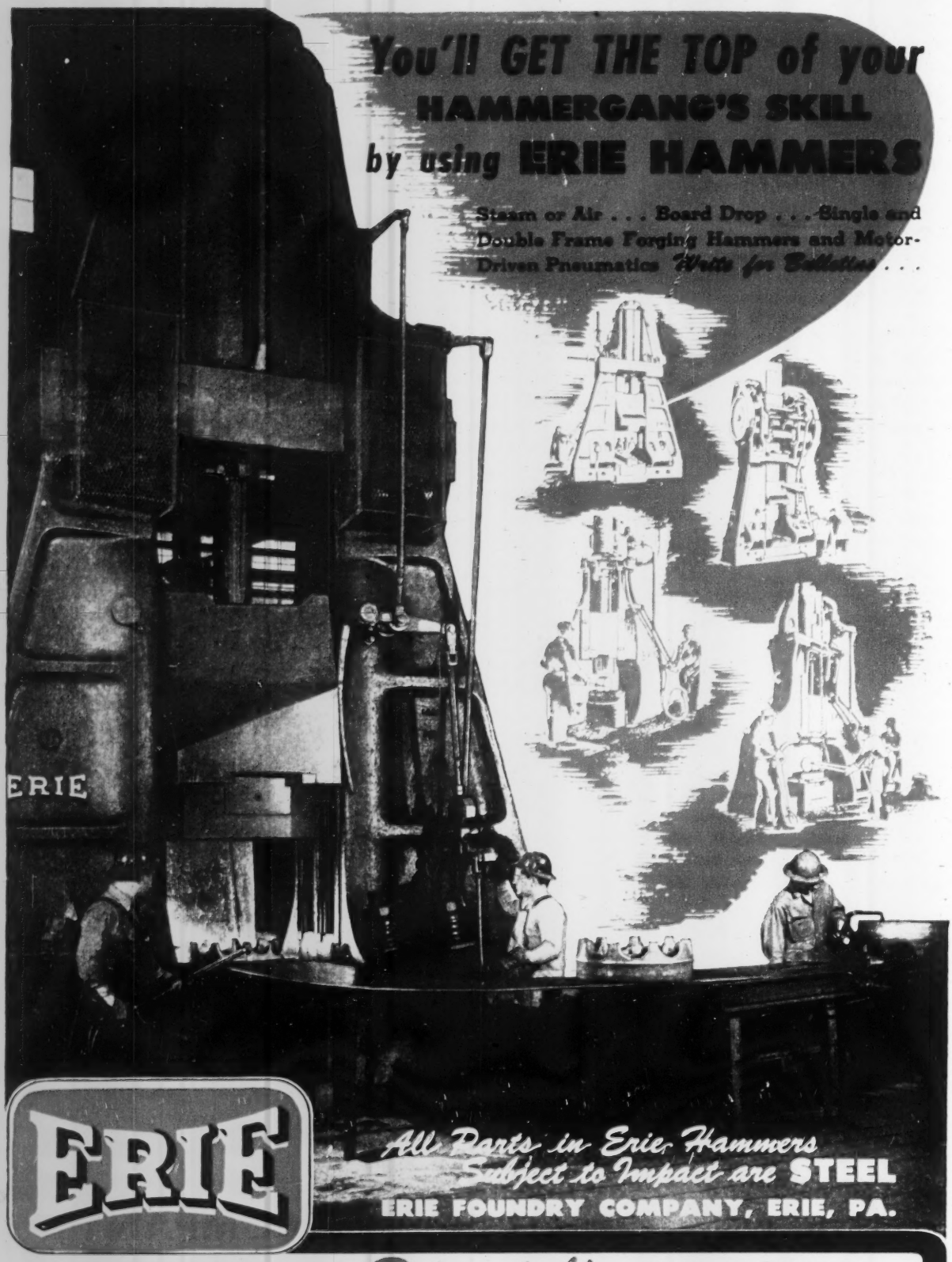
JEBCO
PRODUCTS
SINCE 1889
MAKERS OF BAKER'S MAGDOLITE

THE J. E. BAKER COMPANY
YORK, PENNSYLVANIA
Plants: York, Billmeyer, Pennsylvania—Millersville, Ohio


You'll GET THE TOP of your
HAMMERGANG'S SKILL
by using ERIE HAMMERS
Steam or Air . . . Board Drop . . . Single and
Double Frame Forging Hammers and Motor-
Driven Pneumatics Write for Bulletins . . .
ERIE
ERIE
All Parts in Erie Hammers
Subject to Impact are STEEL
ERIE FOUNDRY COMPANY, ERIE, PA.
ERIE BUILDS Dependable HAMMERS

(*Continued from Page* 116)

Canadian Orenda jet engine and use them to power Canadian jet aircraft.

Builds Metal Stamping Plant

McCauley Metal Products Inc., Buffalo, is erecting a 30,000-sq-ft plant in Tonawanda, N. Y. The firm plans to sell its Forest avenue shop in Buffalo but will continue to operate its main plant at 660 Grant St., Buffalo. The company makes sheet metal stampings.

Foundrymen Elect Officers

Carl A. Larson, partner, Reliance Pattern Works, Chicago, was elected president of Chicago Foundrymen's Association. Reliance Pattern Works, engaged in making wood and metal pattern equipment, also operates an aluminum foundry. R. F. Grover, president, Love Bros. Inc., Aurora, Ill., was re-elected vice president. C. V. Adams, works manager, Vulcan Iron Works Inc., Chicago, was re-elected secretary-treasurer.

Nelson Appoints Distributor

Nelson Stud Welding Division, Gregory Industries Inc., Lorain, O., appointed General Engineering & Machinery Co., Tampa, Fla., as a distributor of its fasteners and equipment in that territory.

Foxboro Opens Branch

Foxboro Co., Foxboro, Mass., manufacturer of industrial instruments for the measurement and control of process variables, opened a branch office at 1117 La Paloma St., Amarillo, Tex. D. T. McElligott is assigned to the office as industrial engineer.

Plant Will Be Re-equipped

More than $4 million will be spent by Westinghouse Electric Corp., Pittsburgh, at its Appliance Division plant in Springfield, Mass. The entire amount will be spent for production equipment. No additional building construction is planned. This constitutes the first step in an extensive expansion program at the facility in which all Westinghouse motored appliances will be manufactured. The manufacture of refrigerator units will be transferred next year to the Columbus, O., $45-million plant which opened last month.

Wide World

Cameraman's Dream Camera Developed

Warren Roll (left) and R. L. Freeman are producing a "dream" camera in their factory in San Rafael, Calif. Their helical-focusing mount, some of which are seen ready for final assembly on the bench, by-passes the familiar bellows on a standard type press camera. The designers solved very complex problems, involving the range finder and a rugged internal flash synchronization mechanism

Engineering Firm Organized

A wholly owned subsidiary, Foundation of Canada Engineering Corp. Ltd., was formed by Foundation Co. of Canada Ltd. The unit is incorporated under Dominion charter with head office in Toronto and an office in Montreal. It will specialize in industrial and heavy engineering design.

Blaw-Knox Gets Contract

Anderson-Prichard Oil Corp., Oklahoma City, Okla., awarded a contract to Blaw-Knox Co., Pittsburgh, for a catalytic reforming plant at its Cyril, Okla., refinery.

AMF To Move Headquarters

American Machine & Foundry Co. will consolidate its New York offices about Feb. 1 in a building nearing completion at 261 Madison Ave. The company creates and produces electronic and mechanical equipment.

Insul-Mastic Licenses Firm

M. H. Ellis Co., Memphis, Tenn., signed a contract with Insul-Mastic Corp. of America, Pittsburgh, to sell and apply Insul-Mastic coatings in that area. These coatings will be used by Ellis for corrosion preventive applications to industrial equipment and for waterproofing of buildings.

Scott Organizes Agency

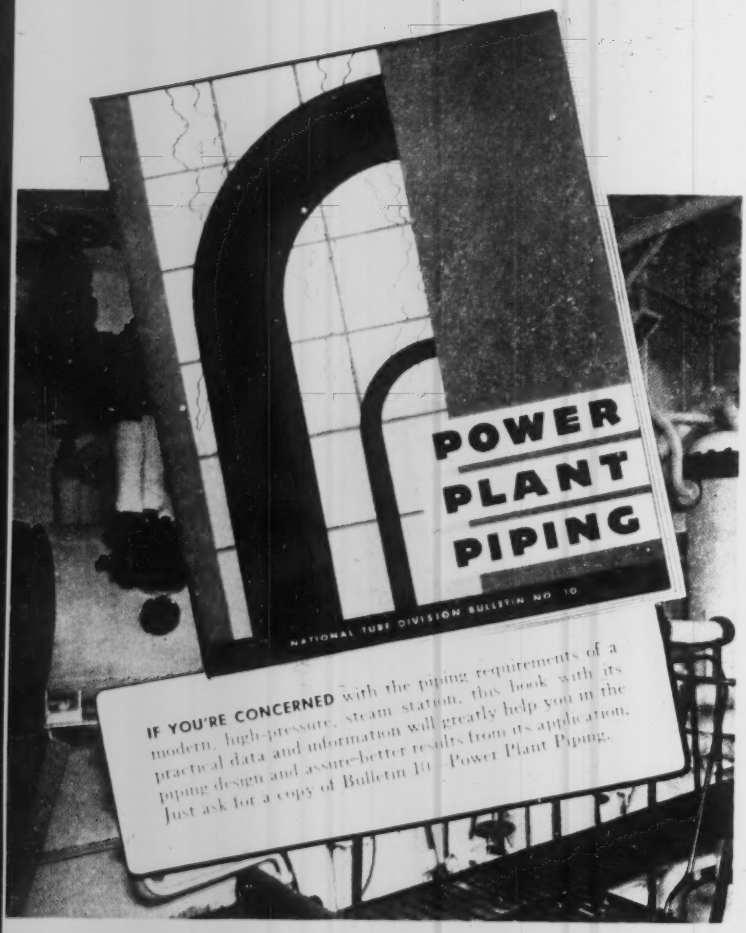
Scott Industrial Equipment Co. has been formed by owners of Scott Equipment Co., Dayton, O. The firm will do business throughout Indiana from an Indianapolis warehouse.

Pennsy Installs Welded Rail

Largest single installation of continuous welded rail ever put into service at one location, enough to construct 112 miles of track, will be used in construction of Pennsylvania Railroad's $34.2-million Conway freight classification yard near Pittsburgh, the railroad says. About 36,000 welds will be required as sections of reconditioned rail will be welded end-to-end to make long stretches of rail

(*Please Turn to Page* 122)

Here's why NATIONAL *Seamless* handle today's higher

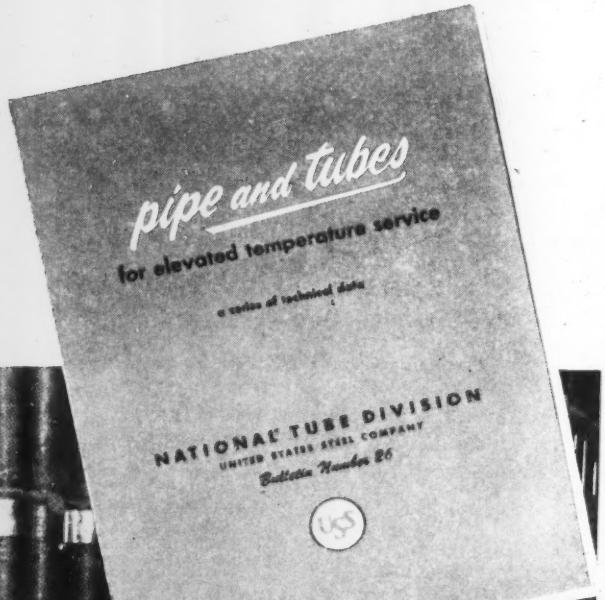


IF YOU'RE CONCERNED with the piping requirements of a modern, high-pressure, steam station, this book with its practical data and information will greatly help you in the piping design and assure better results from its application. Just ask for a copy of Bulletin 10—Power Plant Piping.

THE equipment you use today must meet demands far more severe than those of only a few years ago. That's because stepped up operations, in industrial processing of all kinds and in the more efficient production of steam and power, are continually calling for higher temperatures and pressures.

In the face of these increasingly more difficult conditions it is comforting to know that insofar as pipe and tubes are concerned *all* your needs can be met economically and efficiently by NATIONAL Seamless Pipe and Tubes.

For not only do these famous "Walls without Welds"—pierced from solid billets of steel—provide the unsurpassed safety and dependability of a solid steel forging, but they are produced in a complete range of steel analyses from low carbon to the finest alloy and stainless steels.



IN THIS RECENTLY PUBLISHED BULLETIN 26, you will find a complete and authoritative guide to the selection of the right analysis of pipe and tubing for handling elevated temperatures. The technical data covers 26 different steel analyses representing a wide variety of chemical compositions that are of special interest to users of tubular products who are concerned primarily with elevated temperature properties. Send for your copy.

PIPE and TUBES will help you temperatures and pressures

What is more, NATIONAL Seamless Pipe and Tubes, old in name and rich in service, have never been allowed to rest on past performance. Through the years they have continually been improved . . . not merely to meet industry's more and more drastic demands but always to anticipate them.

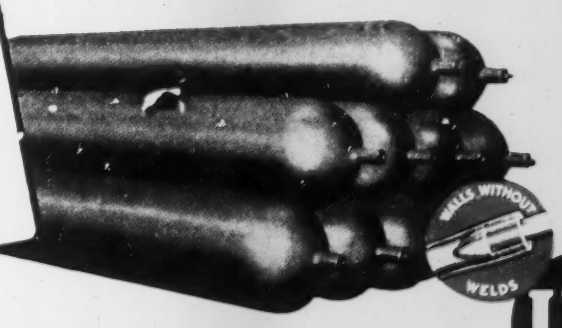
That is why, no matter how severe or unusual your pipe or tube problem—whether it involves extremes of heat or pressure, corrosion, oxidation, exposure, or any combination of destructive conditions—more than likely one of our many analyses of NATIONAL Seamless will provide a solution, reasonable in cost and dependable in service.

NATIONAL TUBE DIVISION
UNITED STATES STEEL CORPORATION, PITTSBURGH, PA.

COLUMBIA GENEVA STEEL DIVISION, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

NATIONAL SEAMLESS CONDENSER AND HEAT EXCHANGER TUBES are recognized everywhere as the finest tubes that modern metallurgy can produce. They are furnished in a number of analyses to meet the different requirements of modern heat transfer applications. We invite you to bring your problems to NATIONAL. Our tubing specialists will work closely with your own engineers to see that you get just the right tubes for your particular requirements.

FOR SAFE, EFFICIENT, AND ECONOMICAL high pressure gas storage, you can't beat NATIONAL Seamless Steel Bottles. Manufactured from seamless steel pipe made by the famous "Walls without Welds" process and formed at both ends, necked and tapped to your specifications, these steel bottles offer the utmost in strength, safety and low maintenance. An inquiry will bring detailed information. Ask for Bulletin No. 25.



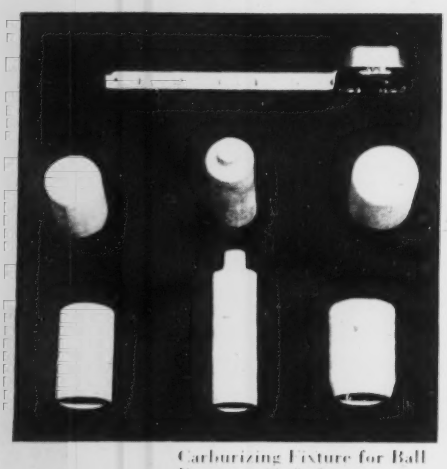
U·S·S NATIONAL *Seamless* PIPE AND TUBING

UNITED STATES STEEL

Small

HIGH ALLOY CASTINGS

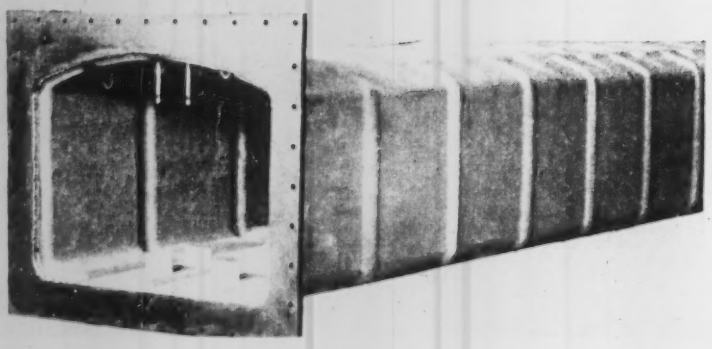
DURALOY



Carburizing Fixture for Ball Bearings 14½" diameter — Analysis 35% Ni—15% Cr

Large

HIGH ALLOY CASTINGS



Muffle for Continuous Strip Annealing 12' 6" long — Analysis 38% Ni — 18% Cr.

LARGE or small DURALOY, can do it! These are just typical examples of the work moving through our foundry. Some of these castings are designed for heat resistance, some for corrosion resistance, some for abrasion resistance; all are cast by experienced foundrymen. All are carefully tested in our up-to-date laboratory.

If you have a high alloy casting problem . . . LARGE or small, we can help you. For more information, send for Bulletin No. 3150-G.

THE DURALOY COMPANY

Office and Plant: Scottdale, Pa. • Eastern Office: 12 East 41st Street, New York 17, N.Y.

Detroit Office: 23901 Woodward Avenue • Pleasant Ridge, Mich.

Atlanta: J. M. TULL Metal & Supply Co. — Chicago: F. O. NELSON 332 S. Michigan Avenue

METAL GOODS CORP. Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

(Continued from Page 119)

for the yard's 150 tracks. The welding operation has been under way at the site for some time in order to build an inventory of rail so as to permit steady progress of installation as track construction proceeds.

Plant Opening Scheduled

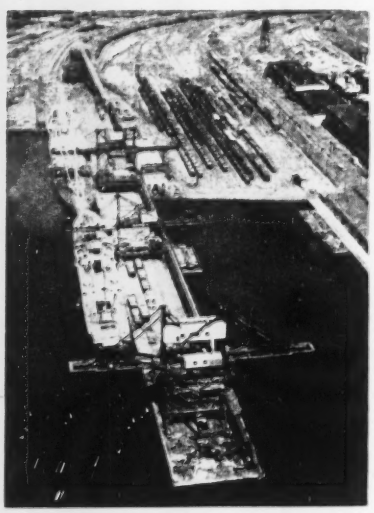
Hooker Electrochemical Co., Niagara Falls, N. Y., will start shipping liquid caustic soda and liquid chlorine from its plant at Montague, Mich., Jan. 1.

Doepke Appoints Agent

Charles William Doepke Mfg. Co., Rossmoyne, O., appointed James M. Cox Co., Richmond, Va., as representative for its small parts materials handling equipment in the state of Virginia.

I-T-E Circuit Expands

Special Products Division, I-T-E Circuit Breaker Co., Philadelphia, moved from the company's main plant to 601 E. Erie Ave., that city. The new plant will also house the company's facilities for assembling jet engine components. The space vacated in the main plant will be used for expansion of I-T-E's small air circuit breaker.

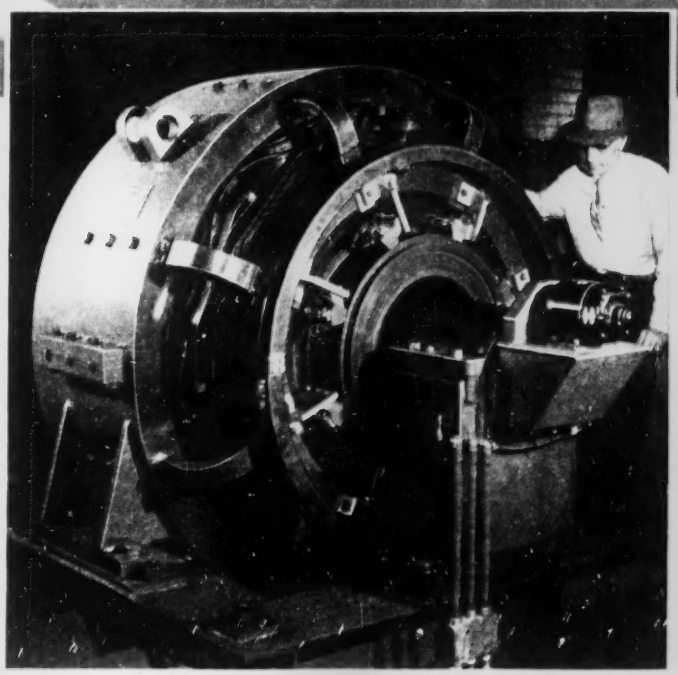


Ore Pier Capacity Up

Canton Co., Baltimore, installed a third ore unloading tower with a 38-second operating cycle. The unloader discharges up to 1900 tons of ore per hour and raises capacity of the pier to 5 million tons annually

ELLIOTT 1000-hp dc motor helps increase capacity of skelp mill

The two additional mill stands and edging rolls driven by Elliott motors were part of a modernization program which increased the mill capacity approximately 20 per cent. The improvements including installation of the new motors were completed in record time.



This Elliott mill type motor rated at 1000-hp, 400/800 rpm, 600 volts, d-c, powers the production-boosting modernization of a skelp mill. This motor drives the two additional roughing stands made necessary by the use of heavier slabs.

A new edging stand, located after the roughing stands, is powered by an Elliott Crocker-Wheeler 200-hp, 420/1050 rpm, mill type motor.

For details on this and other Elliott large motors, consult your local Elliott representative or write to Elliott Company, Ridgway Division, Ridgway, Pa.

Elliott FABRI-STEEL

R3-27

ELLIOTT Company

RIDGWAY DIVISION

FOR MOTORS 1-200 HP. CROCKER-WHEELER DIV. AMPERE, N. J.

Locks Break Bottleneck

Opening of Locks No. 2, rebuilt by Dravo, facilitates movement on Monongahela river

OPENING of the enlarged and rebuilt Locks No. 2 on the Monongahela river at Braddock, Pa., on Nov. 18 eliminates a barge bottleneck in Pittsburgh's vital waterways transportation system. One of the busiest river locks in the world, the structure now can accommodate fourteen 1000-ton coal barges and a towboat, more than three times the size of the tow that could be handled in the old locks.

The locks were rebuilt for the Army Corps of Engineers by the Contracting Division, Dravo Corp., Pittsburgh. The entire reconstruction project cost $17.2 million and required four and one-half years to complete.

First towboat through the landward lock was U. S. Steel Corp.'s sternwheeler, *Homestead*, pushing 12 coal barges. The vessel had left Duquesne Wharf in downtown Pittsburgh with a party of legislators, military officials and members of the Pittsburgh Coal Exchange and Propeller Club of the Port of Pittsburgh. The dedication ceremonies were sponsored by the two organizations.

Mason Forms Distributorship

H. Neville Mason, for many years associated with Dominion Bridge Co. Ltd., Lachine, Que., organized Industrial & Mining Supplies Ltd., Montreal, Que., to deal in heavy machinery, machine tools, welding and mining equipment.

Polk Named to ASME Board

Louis Polk, president, Sheffield Corp., Dayton, O., manufacturer of machine tools, gages and other instruments, was named a director of American Society of Mechanical Engineers, New York.

Will Build Zinc Oxide Plant

Northwest Chemical & Refining Co., recently organized in Spokane, Wash., plans to erect a $200,000 plant to manufacture zinc oxide. Capacity of the plant will be 32 to 35 tons daily. An automatic, odorless process, developed by Barnard Wilcox of Wallace, Idaho, a mining engineer and one of the owners of the firm, will be used.

Baker-Raulang Appoints Agent

Baker-Raulang Co., Cleveland, appointed St. Louis Railway Supply Co., St. Louis, as a distributor of its industrial trucks and cranes to railroads in that area.

Monsanto Boosting Research

Monsanto Chemical Co., St. Louis, announces a $1,250,000 technical service and development program for its Plastics Division, Springfield, Mass., that will include a new research center in the plastics field. The venture will intensify search for new markets and new applications for plastic materials. Surface coatings and foundry resins are specific instances of successful application and research programs.

William Wahl Gets Agency

Beckman & Whitley Inc., San Carlos, Calif., appointed William Wahl Co., Los Angeles, as its representative for southern California. Wahl will handle the company's line of explosive-actuated devices of standard and special design for aircraft, missile and other applications.

Uniflex Cable Changes Hands

United Metal Craft Co., a subsidiary of Gar Wood Industries Inc., Wayne, Mich., acquired the facilities of Uniflex Cable Co., manufacturer of welding cables and other secondary welding connectors. Uniflex products are being produced now at United Metal Craft Co.'s plant in Ypsilanti, Mich. Gar Wood Industries Inc. is a leading manufacturer of truck equipment and road building and construction machinery. Uniflex Cable Co. will specialize in the building of secondary welding connectors for the resistance welding industry. United Metal also makes metal utility tables, splash guards and custom stampings and subassemblies for the automotive and appliance industries as well as equipment for small trucks.

No. 10 STEEL's Management Series . . .

The editors of STEEL herewith present the last in their ten-part series, Program for Management for 1953. Watch for a new series beginning in 1954. The complete list for 1953:

1. Public and Community Relations (Feb. 23, page 53)
2. Industry-Government Relations (Mar. 30, page 53)
3. Research, Basic and Product (Apr. 27, page 55)
4. Purchasing (May 25, page 105)
5. Business Forecasting, Midyear Review (June 29, page 47)
6. Distribution—Post-Emergency Challenge (Aug. 3, page 57)
7. Labor and Industry Relations (Sept. 7, page 101)
8. New Materials (Oct. 12, page 129)
9. Depreciation and Re-Equipment (Nov. 2, page 79)
10. Market Research

Marketing Research

TWO ELATED EXECUTIVES walked out of the Patent Office in Washington with final rights to a new machine that would revolutionize an industry's production methods. After expenditures of nearly $500,000 they were ready to cash in on the development.

Checking with the Commerce department for the best place to start their sales campaign, they found the rosy outlook shattered. Simple calculations proved that if they sold their machine at a profit to every possible user there just weren't enough customers to use the machine, even to return the promoters' investment. This information had been available to them all the time for the price of a telephone call or three-cent stamp.

Don't Chance It—Not everyone gambles that kind of money on a new product or goes off half-cocked after pie in the sky. Yet with every decision it makes, management takes a calculated risk. The successful executives today do not depend exclusively on intuitive judgment. They base their decisions on facts.

With the right kind of information you can reduce the risks involved in any venture by reducing the number of factors that have to be resolved on the basis of judgment alone. That information can be placed at your fingertips by marketing research.

What Is It?—For management's purposes marketing research is the art of knowing or finding out who, what, where and how to sell. It's the gathering, analysis and interpretation of all facts about problems relating to transfer and sale of goods from producer to consumer.

It encompasses three major research areas which in practice overlap and interplay: Products or services, markets and sales methods or policies. The popularly-used term, market research, is only a part of this broad subject and is concerned with means and methods of measuring markets and determining their characteristics.

Engineered Marketing—There's nothing occult or mysterious about marketing research: It's an orderly factual approach any technician applies to a problem. Says one researcher: What engineering is to production, marketing research is to marketing. It's also a frame of mind that of getting facts before you act.

Men steering industry's course today don't hesitate to ask guidance from experts on engineering, accounting, legal or tax problems. Unfortunately, when problems of sales, advertising, markets and prices arise, many management men believe they are their own experts.

Flying Blind—Neither panacea for all management ills nor substitute for management judgment, marketing research can give an able management the facts it needs to develop sound, workable decisions.

It can tell the company where it is today and which way it should move. "Radar doesn't fly the plane, but using it is better than flying by the seat of your pants," comments Dr. Vergil Reed, J. Walter Thompson Co.

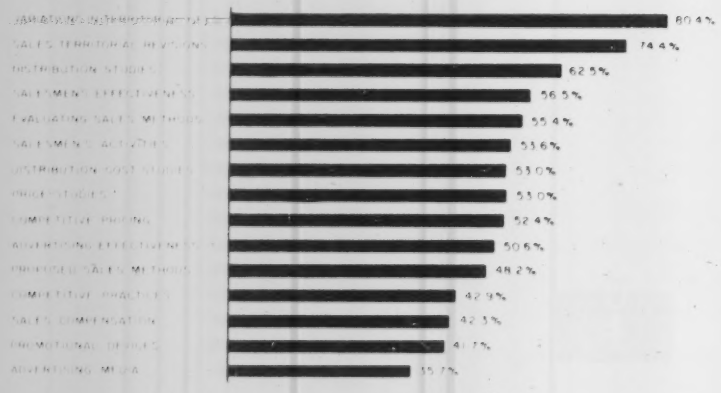
Creative Selling — Today, perhaps as never before, management is faced with an urgent need for the right kind of information to exert creative salesmanship where it will do the most good. A haunting question is arising as pressure of defense needs slacken: How can

What Marketing Research Can Do for You

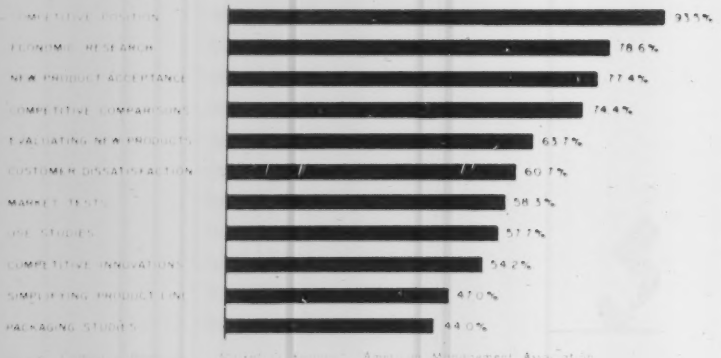
(Areas and extent of use in selected companies)

MARKETS

SALES METHODS AND POLICIES



PRODUCTS AND SERVICES



we make sure our ability to sell will keep pace with our ability to produce? As Dr. Reed puts it, you spend money in production, you make or lose it in marketing.

The potential and the opportunity for creative selling to change habits and create new desires are present today. A 5 per cent increase over our present level of private consumption would offset a cut of $15 billion in government purchases, points out Melvin H. Baker, chairman, National Gypsum Co. Consumer purchasing now is such that actual purchases could be expanded a great deal more than this.

Part of a Team—Modern marketing can use no players who use hunches alone. It requires scientific planning of long range programmed activities, with functional teamwork meshing plans in one basic purpose of making and marketing goods, observes John L. Busey, marketing vice president, General Electric Co.

Research for marketing can't stand by itself either. It must be related and interrelated to every other operation. C. W. Smith of McKinsey & Co., management consultant, says marketing research is essentially a fact-finding function. "Facts can be either figures or opinions; everything can't be reduced to figures and too many people make a wrong assumption that it can be."

Beanstalk Growth

While marketing research hasn't attained full stature in management's eyes, the field is growing rapidly and some excellent work is being done. Membership in the American Marketing Association has multiplied eight-fold in a decade to over 3400.

As a rule, industrial product manufacturers spend a smaller proportion of their sales dollar for marketing research than companies making consumer products. Industry today probably employs from 10,000 to 12,000 full-time marketing researchers, though there is no up-to-date count.

Expenditures—Between 0.1 and 0.5 per cent of sales, depending on size, product range, distribution methods, etc., is a normal range of expenditures for marketing research. The AMA survey showed

a median reported figure of 0.1 per cent for all companies.

Of manufacturing companies, the median reads this way: Industrial goods 0.09 per cent, consumer goods 0.20 per cent, both 0.05 per cent. Nonmanufacturers' median was 0.038 per cent.

Join the Crowd — Most large companies have marketing research departments today, though many are quite young. Smaller companies now using it benefit more too, realizing that men with facts have an edge on those who don't. A development for small companies is co-operative research: Uniting in a group with others in the industry, even direct competitors, small firms can get research as good as big ones and at low cost.

If you're a small company getting along fairly well without marketing research, chances are you'd be doing even better with it. Times were when small companies could easily live off the big gleanings of big companies' harvest. Scientific marketing methods coming into use leave few gleanings.

What It Can Do—It is more important for management to know how to get the most out of marketing research than to know techniques employed. To do so, an understanding of its scope, functions, values, applications and possibilities of use in attaining better management is essential. Some of the more common opportunities for application outlined by Arthur B. Dougall of Stewart, Dougall & Associates are these:

Finding bugs in a new product before it's launched on the market.

Improving old products to keep ahead of competition.

Testing products or packaging for designers before tooling is authorized.

Simplifying product line without hurting distribution and sales attractions.

Evaluating markets in terms of potentials, quotas, sales territories, travel costs.

Forecasting sales and formulating sales controls.

Planning warehousing to effectively serve a market at least cost.

Helping determine type of sales organization needed.

Determining tools needed by salesmen to do an effective job.

Analyzing effectiveness of distribution methods.

Co-ordinating sales and productions to level peaks and valleys and cut excessive inventories.

Measuring opinions which affect methods and policies.

Defining scope and character and measuring effectiveness of advertising and promotional campaigns.

Six Years' Changes in Marketing Research Emphasis

Source: *Changing Practices in Marketing Research*, Council of Management Consultants

No. 1 Job

Marketing research grew from a need for more accurate and thorough appraisal of opportunities facing the sales department and better measurements of results of that department. It is there that application has been greatest.

The research job there is to analyze the department to see if salesmen are properly selected, trained, supervised and provided with effective working tools. Besides assisting in these functions, research can define logical prospects for cultivation and possible ways of reaching them and developing realistic potentials and goals.

Applied Forecasts — A common sales aid contributed by research is the business or sales forecast. Here's how it works in a typical case at Brown & Sharpe Mfg. Co. Annual estimate of new business for the coming year is prepared each September. This report is used as a base in preparing a company sales budget, broken down by products and territories. By comparing each month's actual achievements to the sales budget for each product by territory, management can measure sales effectiveness, and after appraising local territory conditions, pinpoint weaknesses and move to correct them.

Another device is measurement

What Makes A Good Marketing Researcher?

1. A high degree of individual initiative.
2. Inquisitiveness and persistence.
3. Tact.
4. Ability to think objectively and to draw logical conclusions from a given set of facts.
5. Writing ability.
6. Ability to meet people of higher rank and to obtain their interest and co-operation.
7. Ability to get along with people and make them work as a team even though the individual may have no direct authority over others.
8. Appreciation of the sales point of view.
9. Ability to meet all types of people in the field.
10. A firm belief that this type of work is important.

Source: Organization for Market Research, National Industrial Conference Board

of market potential. A manufacturer of industrial rubber goods found sales volume from each territory didn't correlate closely with suspected market potential. To the company's newly-created market research department went the job of analyzing the problem and making recommendations. Through a comprehensive national survey of markets, management's suspicions were largely confirmed. Findings showed salesmen were frequently not located in relation to area potential and often those that were weren't spending their time, effort or expenses in relation to specific customer potential. These corrective forces were applied. Sales force was increased in high potential areas, men moved from low to higher potential areas, field sales controls were set up to enable sales management to determine that the sales force was putting its time and effort against customers representing maximum sales opportunities.

Find Selling Costs—Cost of obtaining sales volume can have an important bearing on profits; a look at total sales volume isn't enough. Here's an example from Richard Manville Research: A company selling through dealers found net profits skidding despite relatively stable total sales. To find which customers were profitable and which weren't, a study was undertaken to reveal the minimum size order for each product that could be handled profitably.

Tabulated against orders, the manufacturer found 64 per cent of his accounts gave him only 11 per cent of his volume. By revising or eliminating unprofitable sales, marketing costs were cut from 23 to 12 per cent and net loss of almost 3 per cent turned into a net profit of 11 per cent of sales. Increased sales to fewer dealers through better directed selling and promotion made the difference.

Improve Advertising — Another major area in which research can be of service is advertising. In one of its most fundamental aspects, says Alderson & Sessions, marketing and management consultants, advertising is an attempt to create demand or accelerate a growth in demand that otherwise might extend over a longer period. To be effective, advertising must get attention, communicate ideas, create an urge to buy.

Economists and marketing experts doubt if some management men really understand the basic economic forces of advertising and its relation to selling. They say there's a business tendency to think of sales as a cause rather than result of advertising, and key advertising to a percentage of sales or unit of sales. That's letting up on the accelerator when you should be pushing down on it. One way to compensate for these cycles is to set aside a portion from appropriations in good times so advertising can be bolstered when sales start down.

Watch Small Orders—A service function of marketing research lies in studies of order handling and repair parts service. With today's rising costs of clerical labor, finding whether a small order is an asset or liability is of growing importance. In tackling the small-order problem at Davison Chemical Corp., researchers evaluated technical service requirements, distributor relations and potential sales volume. In analyzing ordering experience of small order customers over a two-year period, need was clearly established for revision of pricing schedules and effecting new sales controls.

Where customers require repair parts for old equipment, engineering records dating back many years are not always available. Research department at Watson-Stillman Co. maintains complete records of machines sold by class and customer. Filling repair parts orders is simplified. The types of machines in use and demand are shown by such data as machine capacity, job and unit numbers, date bought, where sold and shipped.

Shifts in Emphasis—Geographic shifts in population and industry

mean shifts in inventory volume and emphasis as well as warehousing needs. Did you know, for example, that four-fifths of our manufacturing population is in 272 of the nation's 3071 counties? That half the counties in the U.S. lost population between 1940 and 1950 when total population climbed almost 15 per cent? Research can keep you abreast of these changing conditions.

To determine if you're giving your sales staff support, ask yourself these questions: Do you know the potential market for your product? Are you getting your share? Can you develop new markets? Are you competitive? Is quality as good or better than competitors? How about your service? Can you fulfill boasts of advertising and sales? Do you have the right distribution methods?

With the Times — Alderson & Sessions' F. L. Fletcher points out that the last decade has seen large sums spent on product research that brought a flood of new industrial developments. Companies prospering by these developments are those that had engaged in marketing research and long range planning to evaluate changing market conditions under the impact of such new product development.

A few industry eyebrows were raised when Atlas Powder Co. decided to double production facilities for sorbitol (hexahydric alcohol) back in 1949, a year of declining chemical sales. The company knew what it was doing. While research and development workers were devising new uses for sorbitol and its related chemicals, market analysts studied past, present and potential demand for these products. Capacity was doubled as a result of these favorable forecasts; their basic validity has since been borne out by sales growth.

In design, probable box-office response to your creation can be measured. Knowing in advance what the public will respond to and how is valuable to designers, but few companies give them this help.

Finance Too—In making capital expenditures, business should stop "playing by ear," says Dr. Joel Dean of Columbia University's Graduate School of Business Economics. Expenditures should be undertaken only after an economic and financial analysis of each major project.

An examination of capital expenditure policies of some 50 well managed companies reported by Dr. Dean revealed less scientific control and less skilled analysis than in any other important field of management.

Operations Research—Marketing research can help guide technical research too, by helping management in deciding whether certain projects would be worthwhile or blind alleys. Operations research, a technique borrowed from the military for evaluating probabilities, is gaining popularity. John F. Magee of Arthur D. Little Inc. calls it a new attitude of mind which provides sound, clear, numerical bases on which experienced executives may rely in making up their minds.

Termed "quantified common sense" by Battelle Memorial Institute's Dr. R. J. Lund, it relates complex variables affecting an operation in a statistical manner to show cause and effect. Battelle applies operations research in combination with engineering economics, a method of predicting technical-economic opportunities and risks. In this manner it meshes technical and economic practicabilities. In addition to aiding industrial research, operations research's chief applications come in production planning.

Output planning is a research activity at York Corp. A single department maintains records of sales and production, constituting a single source of historical information. It translates sales fore-

He Never Heard of Marketing Research

NO COMPANY is too small to utilize marketing research techniques. Certain types of simple research jobs can be done by your present personnel, no matter what size the company. "One of the best and most useful applications I've ever known," says Dr. Vergil Reed, associate director of research, J. Walter Thompson Co., "concerns a man who wouldn't know what you were talking about if you mentioned market research." Here's how he tells it:

Tony Checcino was an Italian immigrant. He wanted to start a grocery store but had no money and no credit. After working at day labor until he could buy a team of horses and an old wagon, he made his living for two years collecting garbage and trash in the neighborhood where he expected to have his store.

Each day he tore the labels off the empty cans and packages he collected, put them under the wagon seat, then stacked them in the corner of his room at night. Tony was clean, good natured and frugal. People liked him.

Finally he had earned enough money to open a store. Before he bought his stock of goods Tony took all the labels and sorted them into piles by kinds of product. Then sorted each of these piles by brands.

He threw away all the little piles and bought the brands for which he had the tallest stack of labels. Tony's inventory didn't loaf on the shelves! He knew what his prospective customers wanted.

Duties and Responsibilities of General Electric's Marketing Research Department

MARKETING RESEARCH

Services Department — Manager

Provide marketing research services, advice and counsel to vice president—marketing, as directed to group executives and other services divisions and as requested to operating divisions.

Conduct audits of effectiveness, economy and efficiency of marketing research performance.

Specializing in: Marketing studies and research for use in all marketing functions; study of current conditions, trends and forecasts of

- General Business Activity
- Basic Economic Conditions
- Industry Activity and Position

Promote interchange and usefulness of information on marketing research and forecasting techniques, procedures and activities.

HEART OF MARKETING CONCEPT

In General Electric, the marketing management of each operating department is expected to provide these three fundamental requirements:

1. A Factual Marketing Plan. It calls for each business to have a written yet flexible marketing plan developed in terms of specific short and long-range objectives for profit and leadership; which assures that we will have available a product that people want, at a price they are willing to pay, where it is wanted, and when it is wanted.

(The Marketing Plan makes clear *what* is to be done, *when* and *why*.)

2. A Functional Organization Structure. It calls for an integrated company and distribution organization, designed to carry out this marketing plan and all of the required marketing functions effectively, economically and on time.

(The Organization Structure makes clear *who* is to do the various parts of the marketing job and *where*.)

3. A Managed Operation. It calls for a controlled, well-managed operation in which all of the marketing functions are coordinated and integrated by a dynamic organization which carries out the plans to meet the established objectives of the business.

(The Managed Operation assures that the organization carries out the plan *when* and *how* it is needed.)

casts into production plans, compares actual performance with the forecasts, analyzes results and recommends corrective action when needed.

To Get Started

A mental block often encountered in management of small and medium size companies is the challenge: "What can anyone tell me about my own business that I don't already know?" A doctor can tell him many things about his own body he doesn't know. While marketing research may not always tell him something unknown, it can tell him the degree of good, bad or indifference of known things.

Where To Begin—Everyone can perform certain research operations. Your sales records contain plenty of factual gold worth mining. A simple illustration: What proportion of your customers account for 80 per cent of your sales? The rest may be losing you money. How many customers account for the last 5 per cent of sales? How much of a loss are you taking on them? What are their chances of growing into profitable accounts?

These questions don't require a research department or outside consultant for answer. They not only pay off themselves but indicate where you do need help in doing more complex and extensive research. Other internal records to look to for reliable information about your marketing operations include orders received, sales invoices, inquiries, salesmen's call reports, complaints, service reports, returned goods reports, production reports, financial reports.

Here's Help—Practical steps for a small manufacturer to take to increase sales or reduce marketing costs can be found in a forthcoming book, *Making Your Sales Figures Talk* by C. W. Smith, McKinsey & Co., planned for publication about Jan. 1, 1954, by the Small Business Administration as one of a Small Business Management Series.

In it are outlined techniques applicable to small companies that can't afford to maintain marketing research departments or make extensive use of consultants. Relatively simple analytical techniques

involved can be applied by executives with help from accounting and sales clerical personnel. The book sets forth methods of determining three basic facts:

1. What distribution services (selling, delivery, installation, credit, warehousing, repairs) do potential customers really need?

2. What activities are involved in providing these services?

3. What is the cost of each in terms of the results achieved?

Inside or Outside — Frequently companies take their problems to consultants. Number of marketing and management consulting organizations has swelled rapidly in recent years. Over 150 are listed in the Manhattan telephone book. Most advertising agencies have their own research departments. They also often employ independent research organizations on behalf of their clients.

In deciding whether to use an inside department or outside consultant there's no hard and fast rule to follow. Experts say consulting firms bring focused experience and unbiased view to problems, while inside departments are more familiar with the company, its products and problems.

What does it cost? Median salary, reported in the AMA study, for the top man in the department is in the $10,000-$15,000 range, with salaries generally lower for smaller companies and industrial product manufacturers. Cost of a consulting organization can vary from $500 to over $150,000. Bulk of the jobs fall in the $5000-$25,000 range.

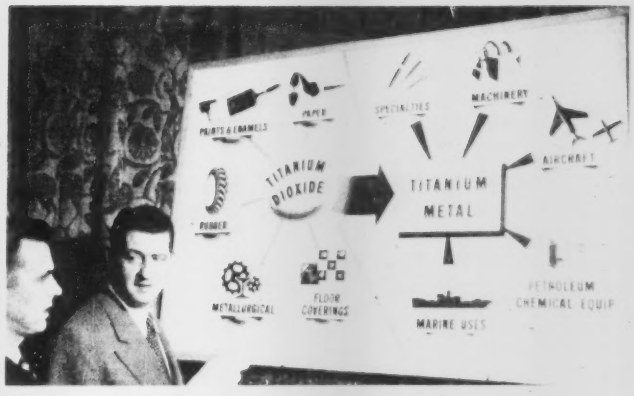
The Man—Solving problems requires a mixture of hunch, logic and experiment. A good researcher must have creative imagination, balanced objectivity, strength of character to resist pressures, a realization from training what he can and cannot do and solid grounding in statistics and methodology. A broad and thorough knowledge of marketing is vital.

Where the department belongs is a matter of controversy among experts. Its place depends on management's concept of marketing research. Practice varies with size, nature and type of business as well as functions assigned. Most often it's under sales or advertising simply because the bulk of information it develops is used there — though experts advise against it. It comprises far more than sales and advertising, tying together company and industry, product, market, distribution and advertising. Research should be a staff organization serving the whole company.

Esso's Setup — Marketing research organization of Standard Oil Co. is divorced from statistical service. Operating on the theory that research is an instrument in helping management reach decisions and establish policy, it does more than develop factual data: It places interpretation on the data.

The department reports directly to the general sales manager and works principally on a two-year basis in scheduling studies. Its three areas of operation are: Market research (consumer and dealer studies), pretesting and post testing advertising effectiveness, and cost research (size of warehouses, number and type of trucks needed for deliveries, types of customers that run up operating costs, etc.).

Help in setting up an effective department and program can come from such organizations as American Management Association which conducts workshop-type orientation seminars for marketing executives. National Industrial Conference Board holds marketing conferences that provide an opportunity to collect and appraise facts, experiences and opinions from top men in business, industry



It Pays To Look . . .

Before You Leap

A LOT OF GUESS WORK can be eliminated from development of new industries by co-ordinating basic and market research. When commercial development of titanium was in its infancy, Kennecott Copper Corp. discovered rich deposits of ilmenite at Allard Lake, Quebec. As capital required was sizable, the company had to learn about titanium's future before development could begin.

Researchers at Kennecott, Battelle Memorial Institute and Armour Research Foundation went to work. Long-range future for the metal looked good, but titanium dioxide was shown to be the larger short-range market and would continue so until about 1960. The venture could be sustained on sales of the pigment material alone, they felt.

With New Jersey Zinc Co., which developed the smelting process for producing titanium slag, as a one-third partner, Quebec Iron & Titanium Corp. was formed and construction began. Today Q. I. & T. is in an enviable position to participate in the future development of titanium metal.

and government. At American Marketing Association meetings top analysts in the field gather.

Digging Data—Facts used by analysts can be anywhere. Often ignored are facts that are already collected. Using them avoids expensive original research. The much-publicized and frequently maligned survey is gaining more acceptance and use in industry. But use them sparingly. In Harrisburg, Pa., a prime test city, a number of houses now bear signs reading, "If you're doing a consumer survey, don't ring this bell."

Government agencies can provide a wealth of valuable data. The Commerce department in its monthly *Survey of Current Business* publishes 4000 statistical series.

Custom Made — Supplementing published information is a variety of material. Did you know, for example, that the Census bureau will prepare special analyses of unpublished data when it is not available in published reports? Just indicate what specific facts are desired and general objective of the study.

Other principal sources of information are: Trade associations, business and trade publications, universities, marketing research companies, advertising agencies, mailing list companies, banks and credit reporting services. For a general compilation, the Commerce department's 1950 edition of *Market Research Sources* is available from the Superintendent of Documents, Government Printing Office, Washington 25. Price: $2.25.

Uniform trading area reporting systems have gained in popularity in recent years. They allow companies to check sales performance against industry total on an area-by-area basis. "State Economic Areas" is available through Commerce department field offices at $1. Hagstrom's Industrial Trading Area Map of the United States, No. 1075, will be available very soon in revised form from Hagstrom Map Co. Inc., 311 Broadway, New York.

Put It Across—Purpose of research is to enlighten and clarify, though some practitioners' reports tend in the opposite direction. Reports must be communicated to management: Lack of merchandising leaves many a sound report gathering dust on executive shelves. Summaries always win great readership; oral presentations sometimes get a point across better than written ones.

Esso Standard researchers find a study requiring more than a half-hour to cover loses audience interest.

Perhaps the greatest failure in marketing research stems from not putting results to work. Stewart, Dougall & Associates stresses this need in taking joint responsibility with management in interpreting and applying results of research. Called marketing management research by the consulting firm, it puts the facts into a management program by recommending action which the analyses and interpretations imply and advises and collaborates in carrying out these recommendations as well.

Nebulous Concept—As management often doesn't know research techniques and blind confidence is no basis for supporting it, research should be judged on what is achieved by results put to use. Needed is a tolerant understanding that a problem or its solution is not all black and white.

Trends and changes are more important to a marketing man than conditions at any given time. A moving picture of the market and marketing position is necessary to plan intelligently. All too frequently a company assumes that a single survey will solve its problems for all time.

Two-Way Street — While management needs a clearer concept of the importance of marketing research to its operations and the panorama of services available, researchers must broaden and deepen their understanding of the problems vitally concerning top management in which their services can be helpful.

Two greatest problems today, according to W. C. Gordon Jr., executive director, American Marketing Association, are: Absence of accurate up-to-date basic data in many fields and determining what type of study should be adapted to a problem to yield the maximum return for the cost involved. Attention to packing research is also low.

Architects Needed — A major fault in the field today, says McKinsey & Co.'s Mr. Smith: "There are too many carpenters and not enough architects. Management basically wants to know trends. Many analysts try to get qualitative and quantitative answers at the same time when a problem essentially requires first getting a qualitative answer and then quantifying it."

There is need today for more men knowing the whole field of marketing and for those with ability to translate what people think into concrete evidence. Researchers must develop a greater breadth of understanding of all phases of our production-distribution process and to help integrate them.

Applications — More research should be done in product, distribution and advertising testing functions. Industrial goods companies appear less interested in consumer preferences but considerably more intrigued by product use than other manufacturers, an American Marketing Association study shows.

Two weaknesses shown by this survey: Some people doing research are not properly qualified for the jobs they hold; and if performed by a line executive the job is likely to be superficial and suffer because of pressure of administrative duties. Most valuable operations reported were studies of market potentials and developing or improving products.

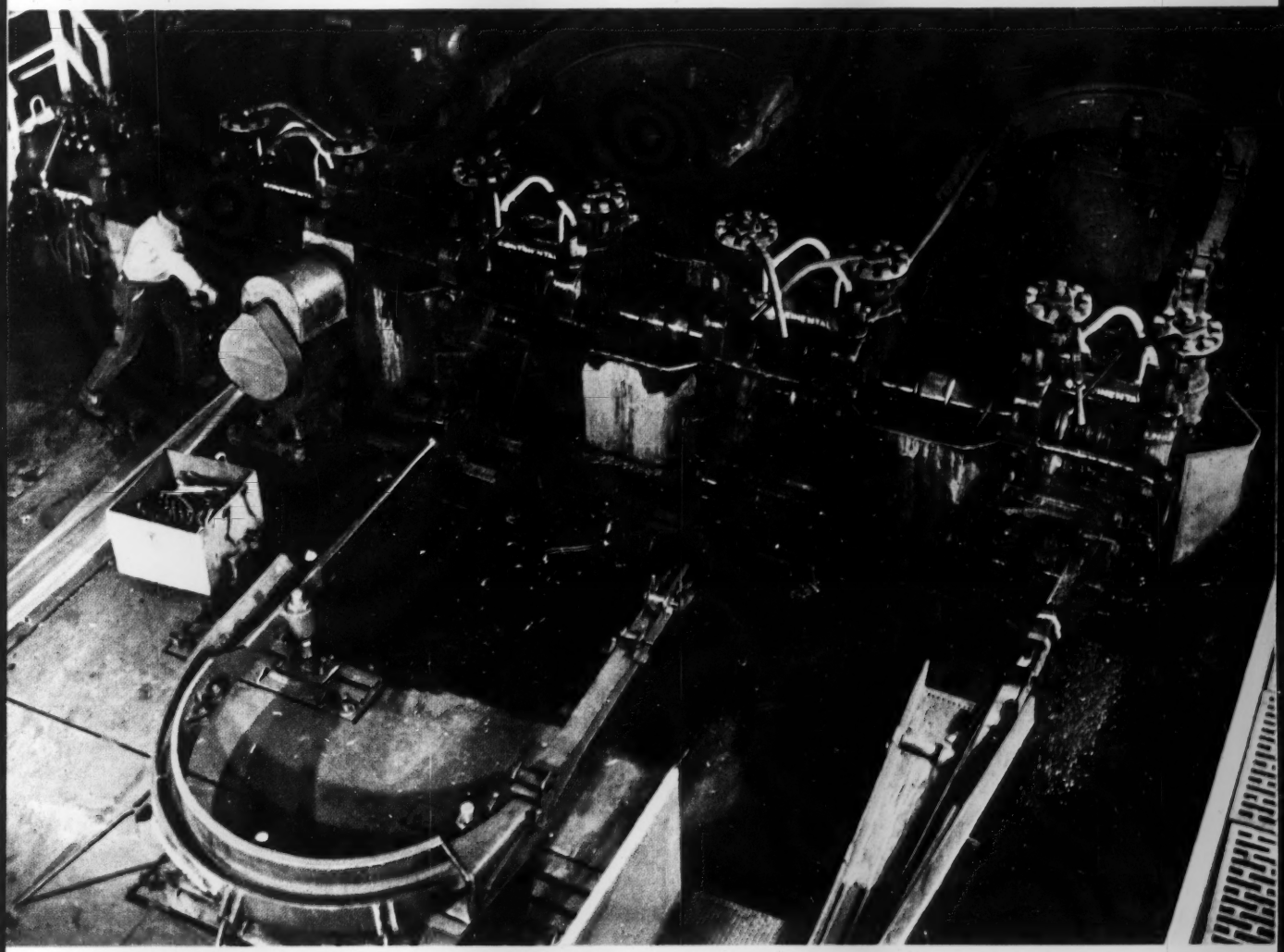
Opportunity Knocking

Today more than ever before the economic health of business is dependent on correct decisions. "The time is past," says R. R. Eppert, Burroughs Corp., "when business can successfully operate from day to day on a basis of empirical decisions predicated on hunches or opinions rather than facts. It's far better to have a diagnosis and cure than autopsy and coroner's verdict."

As a supplement to successful management, marketing research can provide the evidence management needs to check its own thinking so it can channel its creative capacity and concentrate its efforts on the sales tasks ahead.

CONTINENTAL

10-INCH MERCHANT MILL



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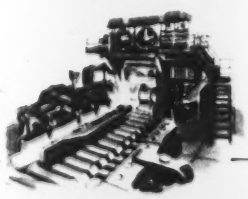

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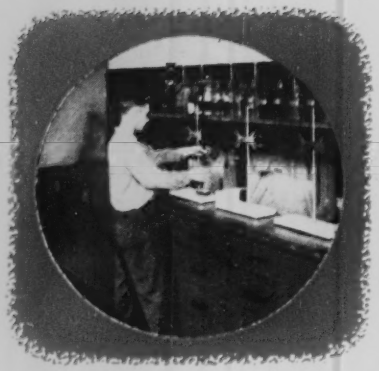
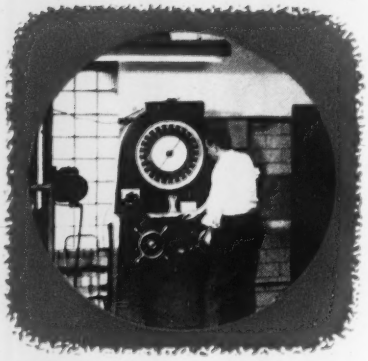
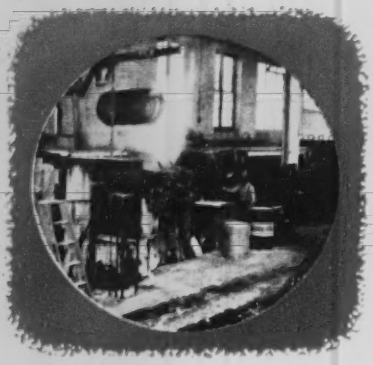
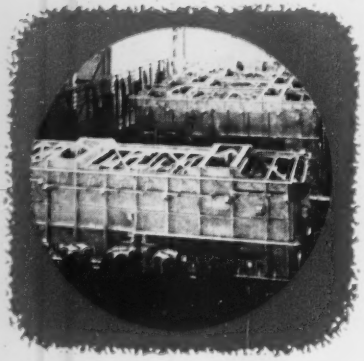
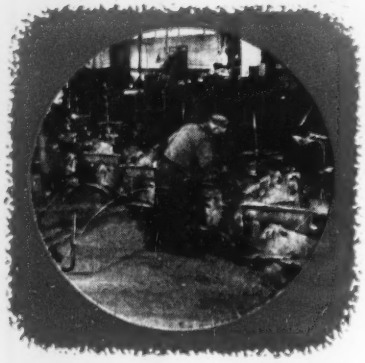




Quality control . . . every







step of the way

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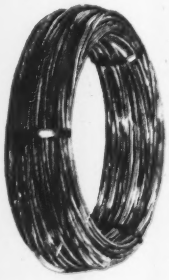

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STEEL

December 7, 1953

Technical Outlook

PUMPS— Double-barreled corrosion resistance is offered by a series of graphite centrifugal pumps being marketed by National Carbon Co. Area of protection: Severe corrosive environments and pumping conditions corrosive to ordinary iron and steel, such as the handling of salt brines and sea water.

GAGING—Beta rays are being used to measure thickness and roundness of small-diameter, thin-walled tubing. Nondestructive testing device is a product of Tracerlab, Inc., Boston.

CASTING ALLOY—Hardenable alloy having corrosion resistance of 18-8 stainless is being produced in cast form by Donegal Mfg. Co., Marietta, Pa., under a license from Armco Steel Corp. Called DC-50, its composition is essentially the same as Armco 17-4 PH, hardenable stainless alloy that is available in wrought form. Properties: Minimum tensile strength of 180,000 psi, minimum yield point of 165,000.

HEAVY METAL—By combining practically pure tungsten with small amounts of nickel and copper, Firth Sterling Inc., Pittsburgh, has come up with a metal that weighs up to 60 per cent more than lead. It has a specific gravity of 17.5 to 18.2 and the tensile strength of good quality steel. Typical applications: Counterweights, accelerometers, balancing weights, radium caskets, x-ray tube screens, flywheels and anvils for hot extrusion and upsetting.

TITANIUM ALLOYS—Those containing iron, chromium, manganese, molybdenum and vanadium are most likely to have desired ductility and strength, researchers at Battelle Memorial Institute, Columbus, O., report. Three of the most successful titanium alloys contain these weight percentages of other elements: (1) Chromium, 3.5; vanadium, 3.5. (2) Manganese, 5.0; chromium, 2.5. (3) Chromium, 1.0; iron, 1.0; manganese, 3.0, molybdenum, 1.0; and vanadium, 1.0. Tensiles up to 170,000 psi for sheets and 195,000 for bar stock (with good ductility) were produced by cooling the metal at relatively fast rates from temperatures between 1300 and 1400° F.

FURNACE WEAR—Steelworkers wearing heat reflecting coats (treated cloth with aluminum foil innerlings) have made repairs in furnaces cooled to 700 to 800° F, according to the Aluminum Association. With conventional protective garments, this type of inside work is limited to 15-second stints. Now, workers can stay in the hot spot up to three minutes.

MINIATURE VENTURI—For work with small quantities of fluids, gases or liquids, a small venturi has been developed by Simplex Valve & Meter Co., Philadelphia. Available inlet sizes: $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$ and 2 inches. Materials: Cast iron, stainless steel or bronze.

TREND—Pressure continues to mount for lighter, more compact equipment that does not sacrifice effectiveness or ruggedness, says Army Ordnance. Reasons given: Global considerations and world conditions increase demand for greater mobility and air transportability.

HEAT TRANSFER—Heat transfer insert has been developed by F. R. Gross Co., Akron, O., to make cooling water flow faster and be at the right places at the right time. Water is spiralled at high velocities and directed by flexible rubber ribs. Some suggested applications: Cooling rolls in paper-coating and rubber machinery, flakers and glass-lined containers.

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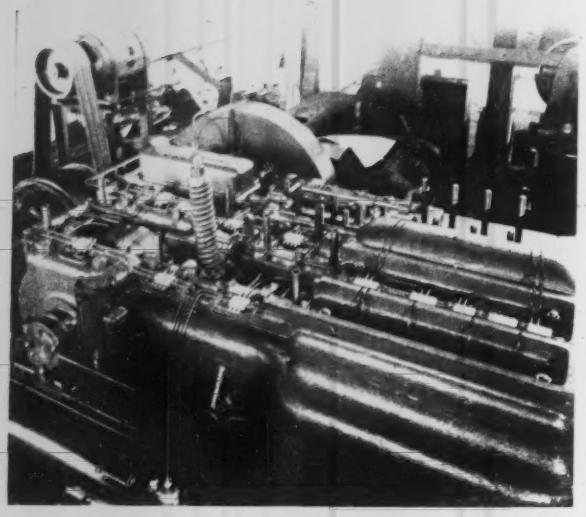
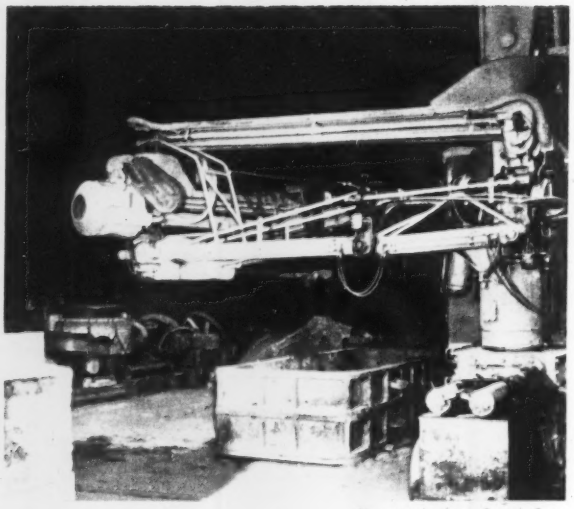




Photographs from Farval Corp.

Centralized systems keep this upsetter on the job, and lubricate 37 bearing points on this sand slinger

Centralized Lubrication

ELIXIR FOR MACHINE LIFE

The right lubricant is only part of the answer. This lubricant, like a good army, must also be in the right place at the right time—and in the right amount

By ROBERT F. HUBER
Machine Tool Editor

NEARLY A quarter century ago a manufacturer in the Chicago area installed a centralized-lubrication system on one of his overhead traveling cranes. Since that time, this crane has never lost a working second for bearing repair or replacement.

In less than five minutes, every eight hours, the operator lubricates the 56 points. He does this without crawling all over the crane.

Centralized lubrication was installed on a 40-inch blooming mill and the savings in power consumption alone more than paid for the lubrication system *in the first year*. The system cost roughly $6000. More than $19,000 was saved in power for that year.

More than Meets the Eye—While these savings are representative, they're only a small part of the picture. Other savings, direct and indirect, enhance the possibilities cost-wise of using some centralized system on production machinery.

Although cost of manufacturing has always been an important figure in the production man's budget, it sometimes slips during a war or emergency period when more attention must be given to production schedules, government contracts, subcontracting and the rest.

When the cycle swings, as it has now, back to a more competitive economy, manufacturers again view their production goals by sighting down the thin edge of the cost dollar.

Mislisted—Although most budgets count the cost of lubrication as part of maintenance overhead, it is an operating charge just as certainly as are tooling, power consumption, scrap handling, cutting oil and efficient materials handling.

It has a direct influence on the ability of a machine to produce, and actually controls, to a degree, the hourly and yearly output of that machine. One stamping press has turned out more than 30 million stampings in the five years since the centralized system was added. It has not been shut down in that time for lubrication, bearing replacement, or, in fact, for anything other than ordinary preventive maintenance.

Art to Science—Chief benefits from centralized lubrication of machinery accrue from its elimination of the human element. Where lubrication formerly relied on the ability, memory and reliability of a man or group of men, it can now rely on a closely engineered and controlled system.

Much new equipment, machine tools, conveyors, rooling mills, cranes, and others, is being designed with centralized lubrication

systems as part of the original equipment.

Oiler has Problems—Substantial savings are being kicked out the window, however, as many machines, now in use, go on their not-so-merry way relying on the skill (in many cases it's guesswork) of an oiler who is handicapped by the very nature of his job.

Many machines have several different types of lubrication fittings which the oiler must know. On some machines these fittings are located all over the machine. The operator has to stop the machine while the oiler climbs around over it filling an oil cup here, squirting a grease fitting there. Naturally, if the machine isn't stopped the oiler should be getting risk pay.

Guess, not Gage—One of the toughest jobs the oiler has is to figure just how much lubricant to apply to each fitting. Under-lubrication, of course, can be like throwing a bucket of water on a forest fire. The idea is all right, but the execution leaves something to be desired.

Over-lubrication, surprisingly enough, doesn't mean just more of a good thing. Too much lubricant in some cases, ball bearings are a good example, causes heat due to churning. In all cases it's wasteful.

Complete Miss—Added to the dangers of over and under-lubrication is that of no lubrication at all. With as many as 50 or more points to service on one machine it is a real challenge, even for the experienced oiler, not to miss one or two of them on his rounds.

Another problem with hand lubrication is contamination. Dust and grit which get into the lubricant eventually work their way into the bearing area and cause excessive wear and scoring.

Even the most skillful and conscientious oiler has no means of being sure that he has properly serviced all the critical areas. He has a job to do and the responsibility of doing it well, but actually possesses little actual control over the outcome.

The Result—When bearing areas, including spindles and slides, do not receive proper lubrication they wear excessively and perform improperly. This machine arthritis is evidenced by excessive downtime for bearing repair, service or replacement. At today's production rates, and those contemplated for tomorrow, downtime becomes a catastrophe.

Centralized lubrication of one sort or another will be the answer to many of your downtime problems. It is not a panacea. On some small machines it's not practical. Where special lubricant is needed for a particular application, that part of the system is best serviced by hand.

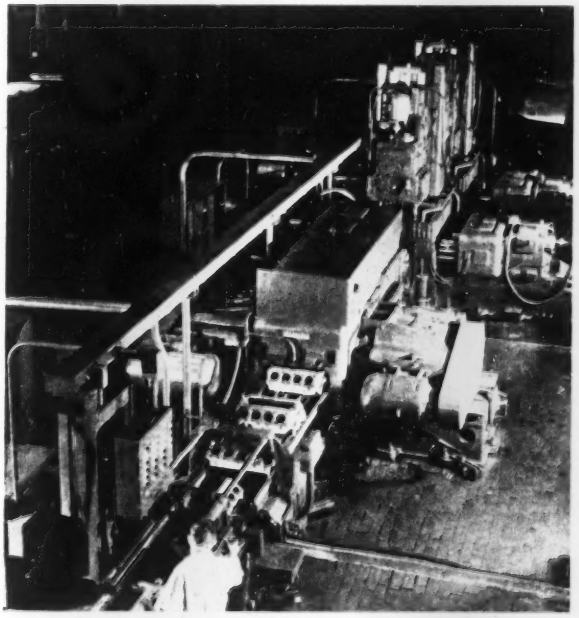
What's Available—The best system for lubrication is the one which has been planned and engineered for its particular application. It will put just the right amount of lubricant on each of the bearing surfaces.

When machines with similar lub-

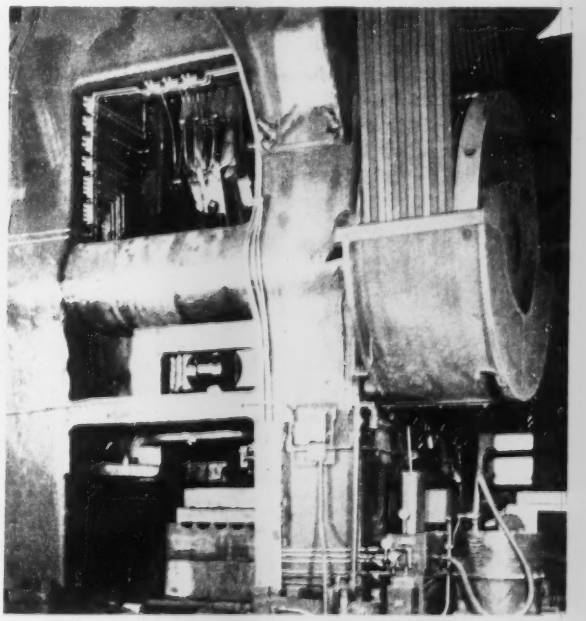
CENTRALIZED LUBRICATION

What It Offers

1. Continuous high-speed operation
2. Positive protection of bearings
3. Elimination of over or under-lubrication
4. Uncontaminated supply
5. Less maintenance—longer machine life
6. Reduced lubrication time
7. Reduced lubricant waste
8. Greater personnel safety



Transfer machines may have 100 points to be lubricated. This one turns out automobile cylinder blocks



Huge forging press needs lubrication at 47 critical points to maintain its pace of 50 strokes per minute

Loop-type system has 415 key bearings to lubricate on this flask conveyor

rication requirements are grouped in one spot, all these machines can be serviced from one central lubricant supply point.

Need Pampering—Some spindle bearings may not require continuous lubrication but may require servicing once every five minutes or so. These can be handled by a timing device which works like an alarm clock. Another device, working on a machine cycle, will lubricate ways just before the carriage moves across them.

In these cases this lubrication is automatic. No one need jog the operators memory to perform the job, and it gets done properly every time, on time.

Power vs. Hand—When a machine needs lubricant only once or twice per shift, the hand-pump centralized system is used. With a couple of strokes of the lever, the machine operator can service every bearing point on the machine giving each just the proper amount.

Indicators at each point tell the operator whether proper lubrication has taken place. Warning devices are available which indicate an insufficient level of lubricant in the reservoir.

First Assistant—When machine requirements call for lubrication more than just once or twice a shift, a completely automatic, self-energized system takes the job over from the operator.

Centralized systems will pump either oil or grease under normal conditions. They also will supply oil as a spray when desired.

Who Says What?—Lubricant manufacturers are enthused when a user converts to a centralized system. While they are often the epitome of patience, the manufacturers find it a bit disconcerting to hear their high-grade lubricant being warmly panned, solely because of misapplication.

The makers of centralized systems feel that increased emphasis on lower production costs and plant automation as well as savings in labor, lubricant and general maintenance will lead to an even bigger market.

For instance, Farval Corp., Cleveland, one of the large system makers, reports that sales in August, '53, were about 6 per cent above those for the same month in 1951. This, in spite of the fact that 1951 was a near record year for the purchase of centralized lubrication installations.

Machine Components—The industry, now doing a $6 or $7 million business annually, expects greater use of systems on the part of original equipment makers. Systems will be a part of the machine rather than accessories.

Meanwhile, expanded application to machinery now in use will curtail many downtime hours and will keep the equipment busy at its primary job producing for profit.

What to Do—You won't convert your whole plant to centralized systems overnight. At least you won't unless you can afford to shut down for a week or so, to allow for the installation.

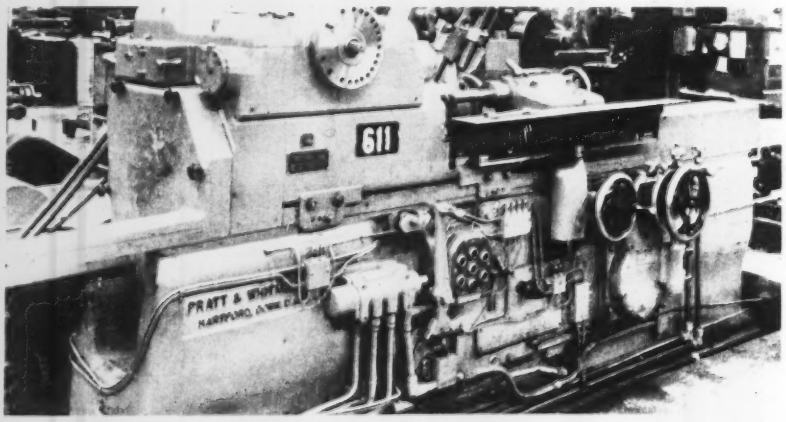
There are, however, several positive steps you can take which will improve your lubricating scheme and will, at the same time, put you closer to centralized systems. First, consider putting a lubrication specialist to work on a full-time basis.

If your plant is large enough, and its operations varied enough, he'll save you dollars on lubricant purchasing, machine maintenance and downtime.

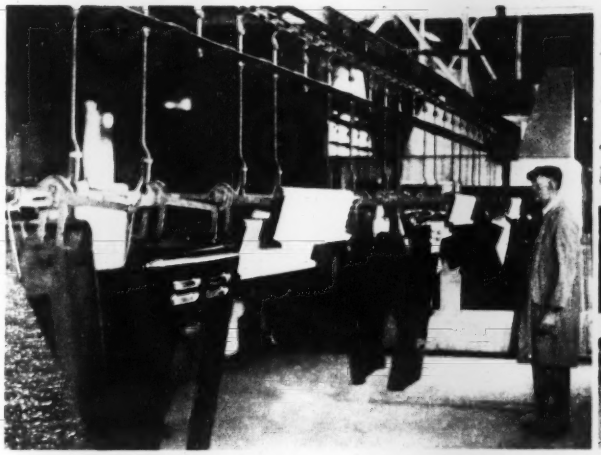
Standardize — Next reduce the number of lubricants used, the types of fittings and the methods of application to a *practical* minimum. This makes good sense, even without any centralized systems.

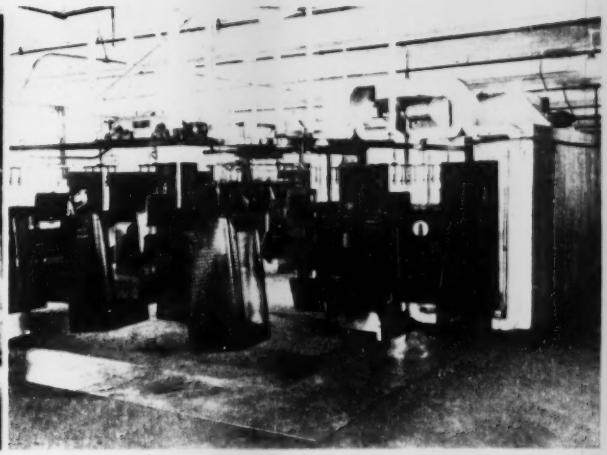
Then find your busiest machines and begin to install centralized lubrication. You'll wince at first when you have to shut down on these key machines, but they are the ones you depend on most they're the ones which *must* have centralized dependability.

Point to Remember—A good lubrication engineer should be the final authority on the "where's" of centralized lubrication. It's his job to save you money.



Thread grinder has 36 points automatically lubricated by centralized system





Furnace Tools Get New Lease on Life

New high temperature ceramic coatings keep down tool scale and re-operations in enameling furnaces. In one test run, tool life was doubled, scale cut to zero

By T. F. MOELLER
Ferro Corp.
Cleveland

FOR many years tool scale in enameling furnaces has shortened tool life and added costs through the need for re-operations. Of course, both items influence the cost of each foot of ware produced.

In the early days of enameling, steel and cast iron were used extensively. Nickel-chrome alloys, far superior as enameling fixtures, came in with continuous flow plants and are now universally accepted, but after a relatively short time, they begin to oxidize, and we still have the old problems of tool life and re-operations.

First attempt to reduce scale was with a dipped or sprayed-on ceramic-type coating. Known as anti-scale compound, it prevents scaling as long as it is bonded to the tool. Disadvantages: It scales from tool and, in itself, is the cause of re-operations.

New Type—However, high temperature ceramic coatings, such as Solaramic, open up a new avenue of approach. Firing of these coatings is in the 1750 to 2150 F range. Metal preparation is as follows:

1. Anneal soak-time depends upon size and shape of piece, which should be brought up to or slightly above the maturing temperature of the enamel.

2. Piece is sand blasted. Method is preferred over shot, because of the possibility of carbon smear that is detrimental to good bonding.

3. Nitric hydrofluoric pickle may be used in place of anneal and sand blast.

4. Coating is sprayed or dipped on, 1 to 1½ mils thick; then piece is fired to maturing temperature.

Test Runs — About 20 plants around the country are running trials on the new coating. Applications include cast suspension bars, coat hangers, fabricated rolled alloy and other special fixtures. Trials also are being conducted on furnace parts, such as alloy drop rods and shoe plate track.

An eastern enameler reports that on a high temperature (1750 to 1950 F) enameling job, uncoated cast alloy tooling was being replaced 100 per cent every 30 days. New set of tooling was coated with high temperature enamel. Every two weeks, as original coating burned thin, it was renewed. Enameler estimated coatings more than doubled tool life and scale was reduced to zero.

In a hollowware plant, high temperature coating prevented oxidation after 16 months. Tool also showed much less distortion than uncoated companion pieces put into service at the same time.

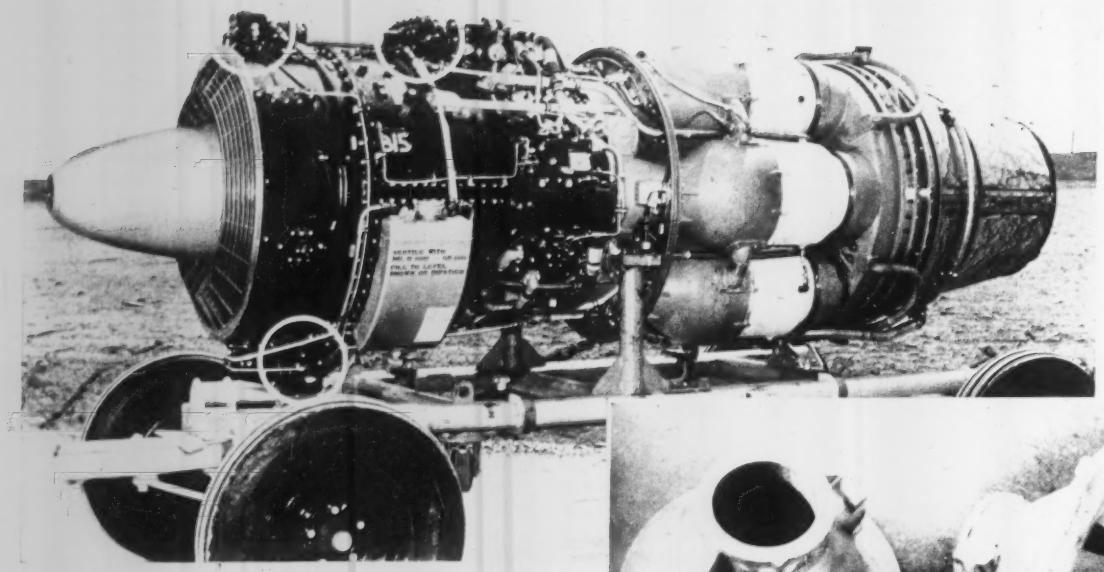
Cost Picture — Cost of coatings varies widely, depending upon weight, size and shape of piece. For example, a 27-inch long, ⅞-inch diameter, alloy drop rod is coated for about $1.35; a 2-point coat hanger for $1.

Cost of coating used tooling is higher, as sand blasting must be thorough. Plant trials indicate results should be comparable to those obtained from new tool coating.

Further trials are being planned to see if lower priced alloys can be used for furnace tooling when coated with high temperature enamels.

To set up economics of high temperature coating, plant operators must accurately find replacement tool costs, plus cost of re-operation due to scale.

Adapted from a paper presented by the author before the recent Shop Practice Forum of the Porcelain Enamel Institute at Columbus, O.



Closeup at right shows housing of gearboxes circled on the Orenda above. Cast magnesium housings are impregnated under vacuum to obtain a jet service quality product

Vacuum Impregnation

Magnesium Castings Meet Jet Standards

Under heavy stress of jet engine service, porosity in cast gearbox housings is out of the question. This impregnating setup, run by one operator, minimizes rejects

HIGH ROTATION speeds of the Sabre Jet's compressor-turbine rotor which may run to more than 11,000 rpm call for a gearbox housing that can withstand considerable stress. Yet the part must also be light in weight. Magnesium castings, a natural choice, are prone to develop microporosity due to shrinkage as the molten metal solidifies.

Porous housings mean oil leaks in operation. Under severe pressure and load conditions of high-speed, high-altitude service, porosity can develop into serious cracks or fissures that could cause failure of the housing. Thus, only those castings free from porosity can be accepted for jet installation.

Minimized Rejections — Under these stringent conditions, York Gears Ltd., Toronto, is making steady deliveries of magnesium gearbox castings to A. V. Roe, Canada Ltd. York attributes the bare minimum of rejected parts to impregnation with Permafil 3255 in vacuum equipment designed and built by F. J. Stokes Machine Co., Philadelphia. Result is an important savings in time and labor, a higher and steadier production flow.

A specialist, York Gears Ltd., is the only plant in Canada devoted entirely to making aircraft engine gears. As such, it subcontracts some important engine parts jobs.

Magnesium housing is placed in Stokes vacuum impregnating chamber. Large castings like these are loaded individually; smaller parts are handled in perforated baskets

After impregnating, excess Permafil is removed from the casting surface by cleaning in lukewarm detergent bath at about 120 F, then use of a wire brush by the operator

like Roc's Orenda which powers the Canadian-built Sabre jets and the CF-100 all-weather interceptor.

No Preliminary Cleaning — If only perfect castings could be accepted, high rejects would make cost exorbitant. It is here vacuum impregnation proves its merit as a means of correcting porosity in aluminum and magnesium castings to achieve sound components.

The porosity-correcting impregnant, Permafil 3255 is a thermosetting resin developed by General Electric Co.'s plastics department and supplied in Canada by Canadian General Electric Co. Ltd. Castings come to the impregnating process directly from the foundry after removal of flash. They need no preliminary cleaning unless they are oily or greasy, but a 30-second pass through a vapor-type degreaser does the job where necessary.

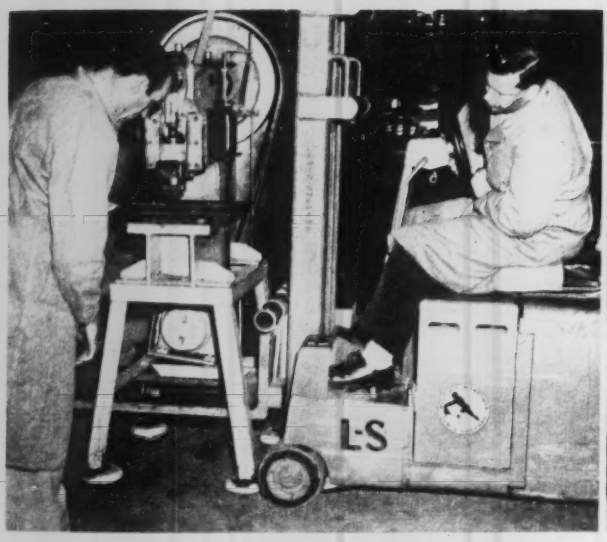
Impregnating Process—Castings are loaded individually into the vacuum impregnating chamber. Size variation means 15 to 100 pieces can be treated in a single batch. Chamber is sealed and vacuum drawn 27 to 29 inches for as complete an evacuation as possible for 1 hour, removing virtually all air from casting pores.

Supply line from the impregnant storage reservoir is then opened and Permafil drawn into the impregnating tank by the vacuum until it covers the castings completely. After vacuum is maintained for 20 minutes, it is broken and air introduced at 100 psi. This is maintained for 1 hour to speed the impregnation process. Return line to the impregnant reservoir is then opened and air pressure reduced to 5 psi sufficient to drive excess Permafil out of the impregnating tank.

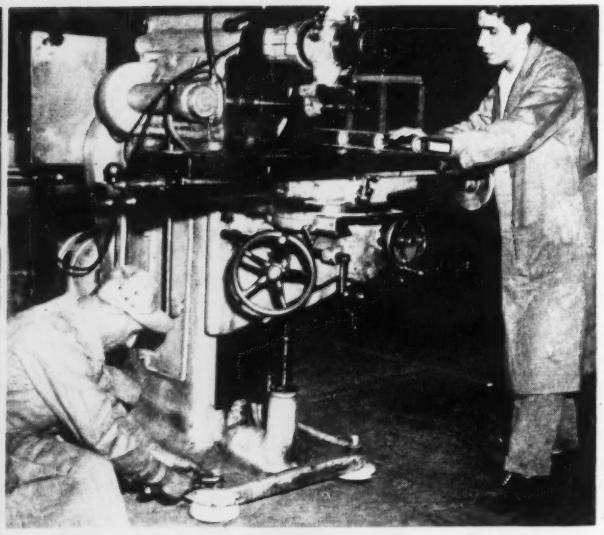
Time Schedule—Cleaning is accomplished in a lukewarm water solution containing a mild detergent, at 120 F, to remove any excess plastic on the casting surface. Parts then are rinsed in clear water at the same temperature, and placed in a curing oven where they are baked for 1 hour at 200 F to bake plastic thoroughly.

York's impregnating equipment is operated by a single man per shift, two shifts a day, five days a week. Total time for impregnating each batch of castings is 5½ to 6 hours.

Rack of impregnated castings is lowered into the oven, where plastic is cured for 1 hour at 200 F. Conveyorized rack simplifies the operator's job



A fork-lift truck lowers a press mounted on leveling mounts to the floor. In the test machine line move, this press was leveled and operating 3½ minutes later



Illustrated here is the technique employed to level a machine prior to operation. While one man holds a level, another tightens or loosens bolts, depending on floor

Mobile Machinery . . .

BUILT-IN LEVELERS MEAN FAST SHUFFLE

Light traveling mounts that support 6 tons each provide considerable installation mobility. Here, eight machines were relocated and operating in 23 minutes

CHANGING ECONOMY forces most forward-looking firms to have new product plans in reserve. But speed in converting plant output is essential in responding to elastic markets.

Good mobility of equipment can also mean a better return on existing machinery, less replacement outlay. If machines can be moved easily, they can be made to serve out their useful life on the job instead of standing idle where they are riveted to the floor.

Installation: 3 Minutes — Nowhere is this principle of mobility exemplified more clearly than at Barry Corp.'s plant in Watertown, Mass. Here a line of eight machines was moved 125 feet, and all units were operating 23 minutes after being moved. Without bolting or shims, average time for installation of each machine was slightly more than 3 minutes.

Responsible for this fast shuffle is a development in machine mounting employing a steel-enclosed rubber compression leveling mount designed to isolate machines from shock and vibration, with reduced noise. Barry itself makes the mount used to do the job.

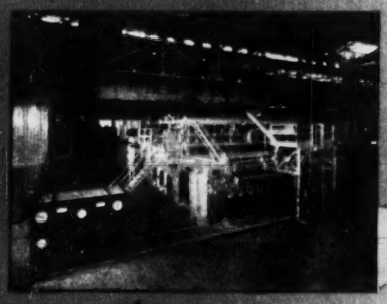
Fast, Simple Mount—Machine mounting is a fast and simple operation. Leveler is placed under the raised machine foot and an attaching bolt, with locknut threaded on, is slipped through into the mount. The bolt is turned down until it has bottomed. After each mounting foot is fitted, bolts are turned down enough to level the machine, and locknuts tightened.

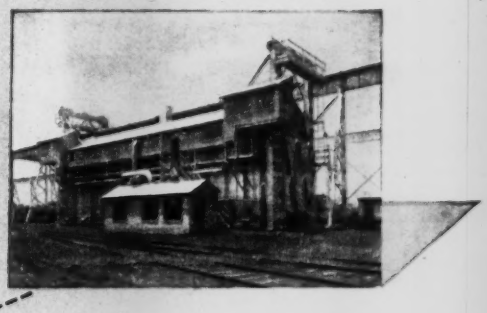
In the Barry machine line move, heaviest equipment mounted was a 45-ton capacity press weighing 4200 pounds. First unit was operating in 12 minutes. Timed without leveling mounts was a punch press lagged to the floor with bolts through drilled holes. It took 33 minutes to get this unit going.

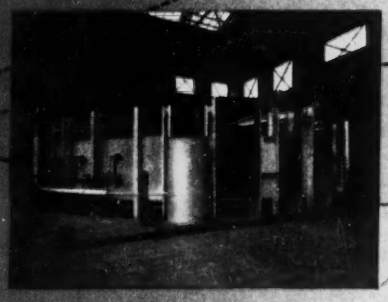
Filling Unusable Space—In making its switchover, the company employed other recently-refined devices calculated to reduce installation time. These include flexible power distribution lines, air screw drivers and electric nut runners.

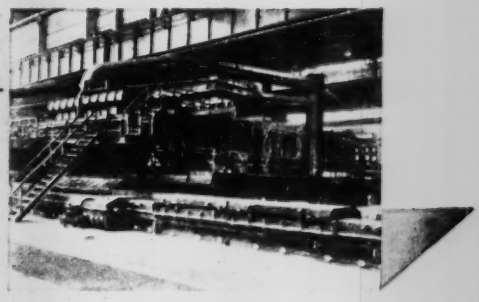
Another result of the leveling mount development is to occupy profitably space otherwise unusable. Without a requirement for concrete floor reinforcing to carry lag bolts, and by reduced rotary vibration, a heavy machine can be located in places that were formerly out of the question.

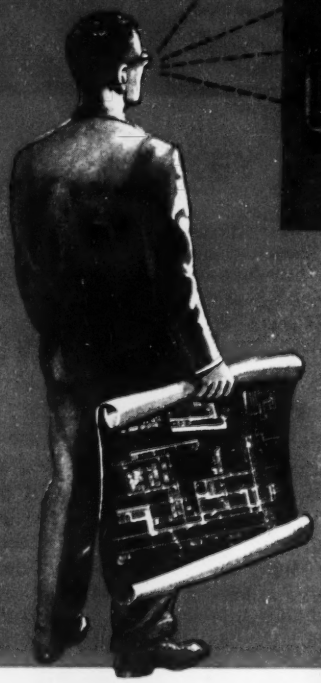
LOOK TO RUST FOR FURNACE EFFICIENCY











METAL INDUSTRIES RELY ON *Rust furnaces* FOR GREATER OUTPUT AND PROVEN ECONOMY IN ALL PHASES OF METALLURGICAL HEATING

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(Advertisement)

What it takes to make a 3000 Degree Refractory Concrete

Because of the widespread interest in the use of refractory castables, many furnace operators have asked us for the story behind the performance of B&W's unique refractory concrete, Kaocast.

Here are the answers to some of the most frequently asked questions:

Q. *When you refer to Kaocast as a 3000 degree refractory castable, do you mean that its melting point is 3000° F?*

A. No, this means that its service use limit is 3000° F, its melting point is 200 degrees higher.

Q. *Just what does it take to make a 3000 degree refractory castable like B&W Kaocast?*

A. Let's first define a few terms. Refractory castables are made with granular materials which are volume stable at high temperatures and which can undergo repeated heating and cooling cycles without disintegration. These materials, known as refractory calcines or grogs, are blended with suitable hydraulic binders. The initial strength of a refractory castable is thus developed in the same manner as that of ordinary concrete—that is, through the chemical action between water and the binder. A strong *ceramic bond* is formed when the refractory castable is subjected to temperatures above the vitrification point.

Q. *Then you have a grog, a binder and a method of putting them together. Which is most important?*

A. You can't say that any *one* is most important. It's a combination of all three. Let's take them one at a time. Our grog consists primarily of the proper blend of kaolin and other alumina-silica materials. This ratio enables us to achieve a grog with minimum expansion and shrinkage, a high fusion-point, and greater stability under load, at varying temperatures.

Q. *And now, what about the binder?*

A. There are a number of factors responsible for the success of the Kaocast binder. One is the compound Tricalcium Penta-aluminate (5 lime to 3 alumina). This formula produces the most refractory compound (highest melting point) that can be made from lime and alumina. Another is that by using the purest commercially available lime and alumina, the Kaocast binder is substantially free of iron and silica. Such traces of these that are present combine during the preturing of the binder to produce stable compounds.

Q. *Just how important is the manufacturing or "blending" of the grog and the binder?*

A. If one factor could be singled out as "most important" it would be quality control.

Direct control over the fineness of materials, preturing temperatures, and other phases of manufacture is possible at B&W because both the grog and the binder are made and blended at B&W's Augusta Works—under B&W's direct control and supervision.

Q. *These factors you've discussed must add up to some specific advantages of Kaocast. What are they?*

A. B&W Kaocast has all the advantages of easy installation which are responsible for the widespread interest in refractory concretes, plus these exclusive features: It is the only 3000 degree refractory concrete with high resistance to spalling and low volume change throughout its operating range.

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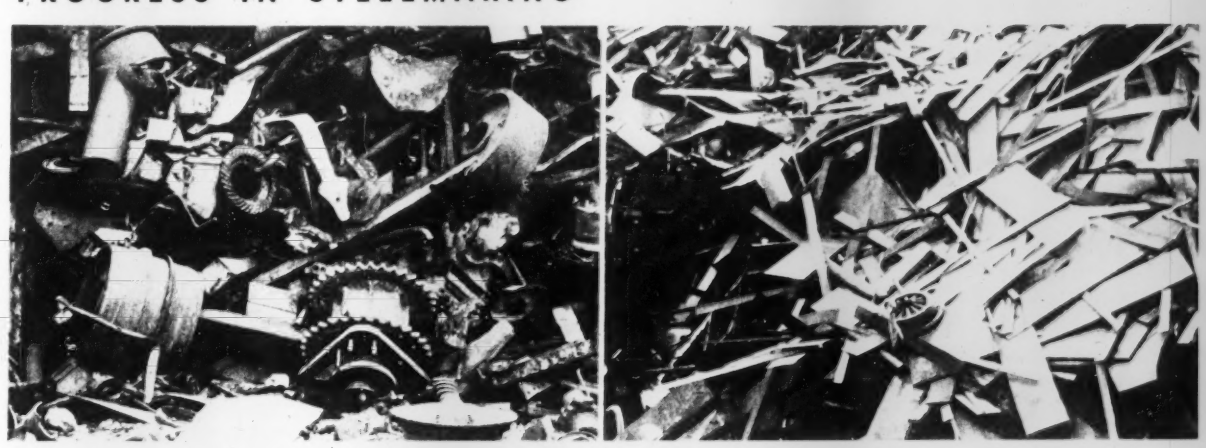
Refractories Division
General Offices
161 East 42nd St., New York 17, N. Y.
Works: Augusta, Ga.



Photos show difference in two grades of scrap. At right is No. 1 grade, with minimum of baled sheets and miscellaneous scrap. Grade No. 2 contains larger amounts of purchased scrap for the lower quality steel requirements

Scrap Preparation . . .

KEY TO QUALITY AND ECONOMIC CONTROL

By E. W. HUNZIKER
Superintendent, Open Hearth Department
Columbia-Geneva Steel Division
U.S. Steel Corp.
Pittsburg, Calif.

Program of educating and understanding scrap dealers, and a fresh look at their own operating practices has blossomed new efficiency for Columbia-Geneva Steel

IN THE YEARS prior to 1951 it became evident that the over-all quality of purchased scrap in this area had deteriorated to such an extent that steel quality and open hearth production rates were being adversely affected. This was reflected in heat diversions due to high residual alloy content and in excessive charging times and furnace delays due to lack of segregation, off-size and poorly bundled scrap.

The open hearth shop of U. S. Steel's Columbia-Geneva Steel Division at Pittsburg, Calif., is a "cold metal" shop, utilizing a high-scrap, low-pig iron charge. Typical furnace metal charges weigh about 190,000 pounds and in 1950 and 1953 consisted of:

1950	Type of Scrap	1953
41%	Purchased Scrap	30%
59%	Home Scrap, Pig Iron & Cast Iron	70%

"Home" scrap, consisting of baled sheets, balled side trims, bloom butts and crops, chopped continuous pickler side scrap and other plant-produced scrap is of rather narrow chemical composition range and capable of close control. Same can be said for the cold pig iron used; so that it is the purchased scrap which is variable both in contamination and physical shape. It was this part of the charge toward which improvement was directed.

Three Factors—Improvement in quality and production rate is accomplished best by the combined efforts of both scrap dealers and the scrap consumers. For example, charging time depends on three factors: Amount of scrap used in the charge; facilities and equipment provided at the mill for stocking and charging; and the weight of the scrap per charging box.

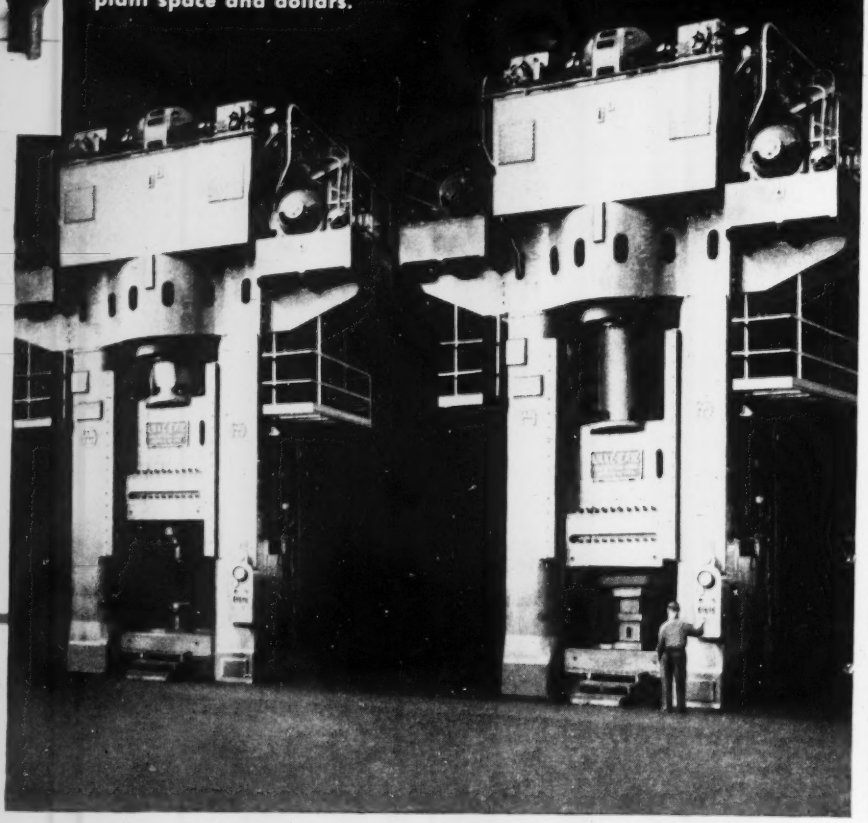
Obviously, the amount of scrap used in the charge depends on the type of operation for which a given open hearth shop is designed. A mill using a high scrap charge has a much greater problem than one using a relatively low scrap charge (with high percentage of hot metal).

Split Responsibility—Facilities and equipment at the mill for handling scrap are the responsibility of the scrap consumer. Generally these are adequate, but factors such as increased charging box size, transportation equipment, larger magnets, communications equipment, etc. should be re-evaluated continually.

The weight of scrap per charging box is a function of the dealer and the consumer; that is, better scrap preparation by the dealer, and improved loading of the scrap into charging boxes by the mill stockers. Use of oxygen and other improvements for faster melt-

WORLD'S FIRST COMMERCIAL FACILITY

● Typical parts produced by Mullins Steel Koldflo* Process with a definite savings in steel, manpower, machine tools, plant space and dollars.



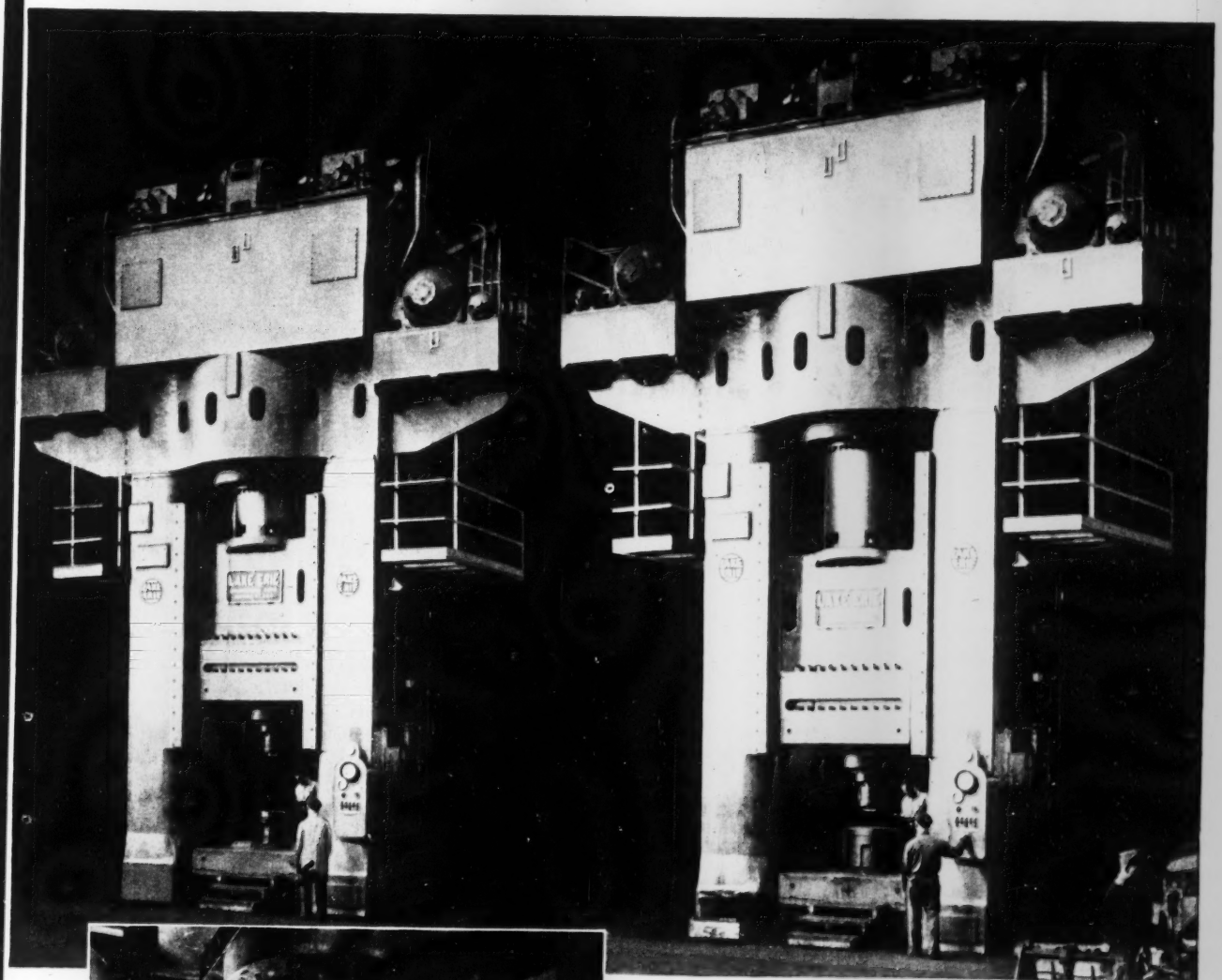
for producing parts by MULLINS STEEL Koldflo* Process

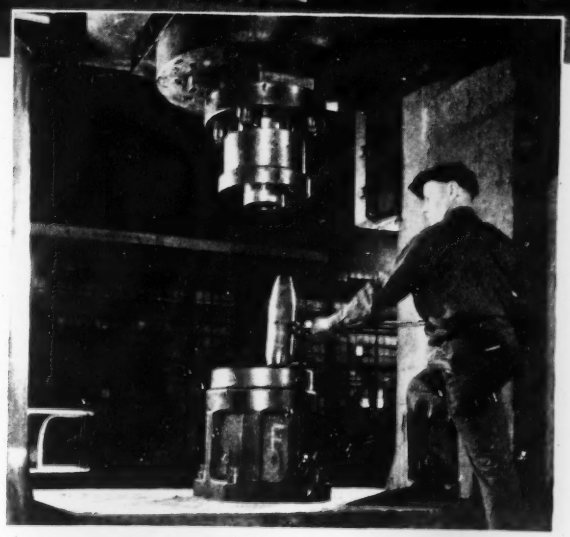
This new facility of the Mullins Manufacturing Corporation makes available to American Industry for the first time the economies and other advantages of Koldflo* production. It is a process in which parts are cold-formed into hollow shapes with a wide variety of configurations and in lengths from 6" to 36" with diameters from 2" to 6". The finished products come from the presses with smoothness, hardness, strength and precision. All of these desirable features are obtained by this process while using low carbon, low cost steel.

MAIN BATTERY OF PRESSES FURNISHED BY LAKE ERIE

These four 5,000 ton hydraulic presses weigh over 700,000 pounds each. They stand 55'-8" above the floor and extend 6'-7" below the floor. Beds measure 72" x 60", daylight openings are 96" and strokes 48". The high speed, self-contained pumping units on each press are powered by 750 HP motors. This installation is another excellent example of Lake Erie's ability to construct hydraulic presses for any process or manufacturing requirement.

*Koldflo is a trade-mark of Mullins Manufacturing Corporation.





FIRST PRESS PRODUCED IN THE UNITED STATES SPECIFICALLY FOR THE COLD EXTRUSION OF STEEL

Close-up view of the original 5,000-ton Lake Erie laboratory press purchased by Mullins in 1949 for Kolditte development and production. Outstanding performance of this press led to the selection of Lake Erie equipment again for the main battery in Mullins new commercial installation. There can be no better evidence than this of customer confidence and satisfaction.

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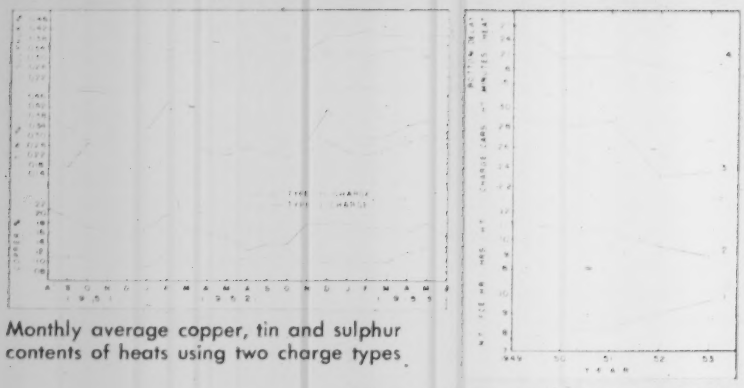
LAKE ERIE 59



Monthly average copper, tin and sulphur contents of heats using two charge types

Influence of improved scrap preparation practices on open hearth production

ing will not be fully effective if faster charging is not achieved.

Growing Problem—Residual element buildup in steel has been noted by all scrap consumers in recent years, particularly those using a high percentage of hot metal. A point is reached where residual elements are not the same for all types of finished steel, many products having arbitrary specifications such as 0.35 per cent copper, maximum and 0.030 per cent tin, maximum.

In the case of carbon steel plates, for use in fireboxes and boilers, a very thorough investigation of the effect of residual copper, nickel, chromium, molybdenum and tin, within the ranges normally encountered, has shown that no detrimental effect on tensile and impact properties resulted from the presence of the residuals.

However, in our own operations, where more than two-thirds of the open hearth production consists of heats for wire products, presence of residual elements in excess of relatively low limits is known to be harmful in several respects. The majority of our wire heats are low carbon rimmed grades and are subject to the following mill specifications, adopted in 1946:

Copper	0.30% Maximum
Tin	0.070% Maximum

Copper % plus 4 times the Tin % must not exceed 0.450.

It has been found that when residual content exceeds the above, the steel is prone to over oxidation in heating. On subsequent rolling in the rod mill, slivers may be produced which result in mill cobbles and rapid wear of wire drawing dies. Heats which exceed the above residual specifications are diverted to lower grade products or to the heavier gages where the effects are less harmful.

Scrap Dealers Educated—It has been said that "good scrap preparation begins with education and ends with compliance." In the scrap preparation improvement program instituted at Pittsburg Works it was recognized that much depended upon the education of scrap dealers concerning the problems faced by the mill.

Dealers' representatives, including not only owners but also yardmen, are taken on plant tours; specific examples of unsatisfactory conditions are pointed out and required improvements explained, such as less contamination by tramp metals and nonmetallic materials, better physical shape of baled sheets and improved preparation of miscellaneous scrap.

Operating Men Too—It has been a practice of operating and purchasing representatives to visit various scrap suppliers within the area for the purpose of discussing our scrap requirements. During these visits our representatives also become familiar with the dealers' problems. Visits also include talks with yardmen who are doing the actual preparation. Advice concerning preparation is given while the process is going on.

A continuous follow up has been maintained since the start of the program. The point is always stressed that we do not want contaminated scrap because of the adverse effect of the resulting high residual element content found in the steel made from such scrap. Data is furnished to the dealers regarding the value of nonferrous material which could be realized by dealer segregation rather than allowing it to remain mixed in with steel scrap.

Identify the Dealers—Early in 1952, the Pittsburg Plant instituted a dealer identification system for baled sheets in order to trace responsibility for poor physical shape and content. The system provides, for each of 26 sources, the painting of a characteristic and distinctive mark on their bales using various paint colors. Lists showing the different markings used by each of the dealers are carried for ready reference by all mill personnel concerned.

Identification of incoming cars of baled sheets is made easier and more positive than it was when we depended on car numbers alone. System definitely encourages better preparation by the dealers since they realize there will be no difficulty in identifying their scrap should it be poor enough to warrant rejection or down grading. The condition of dealers' bundles has shown considerable improvement since the inception of this program. Physical shape has been satisfactory, and contamination, as determined by cutting open bundles for spot inspection, has been less of a problem.

Spot Checks—A visual inspection is made of every carload of scrap received. In addition, each carload of baled sheets has two bales removed, one from each end of the car, and these are torch cut for internal inspection. Poor bundle shape or tramp metals or nonmetallic material found present in the interior of any bale is sufficient cause for rejection of the entire car. Miscellaneous scrap found to be of a poorer grade than contracted for is down graded, and a lower price negotiated, or the car is rejected.

Knowing this, dealers will establish segregation practices in their own operations to avoid the shipping of materials which are out-of-specifications. When a contaminated car is found, the dealer

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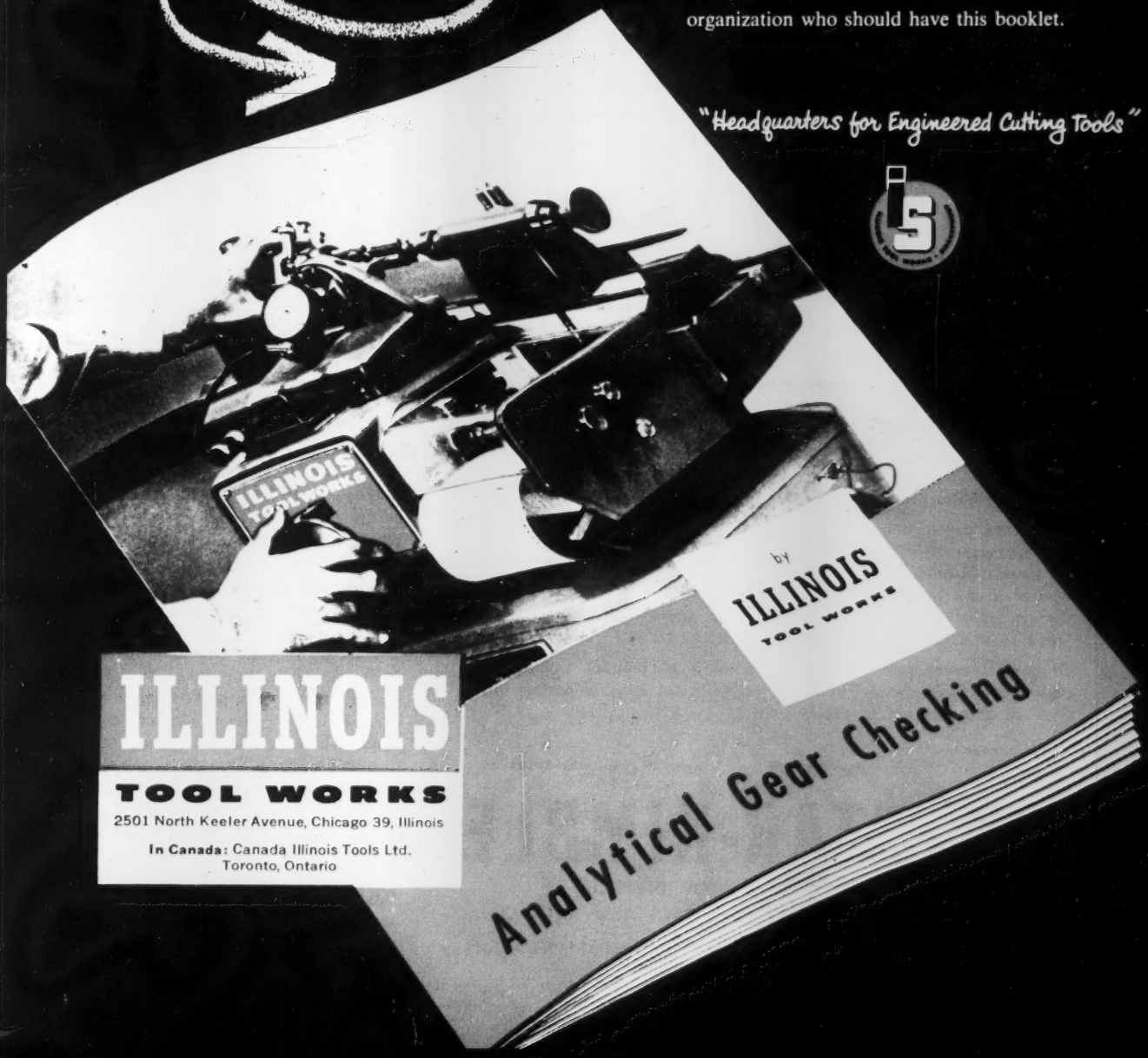
"Headquarters for Engineered Cutting Tools"



ILLINOIS

TOOL WORKS

2501 North Keeler Avenue, Chicago 39, Illinois

In Canada: Canada Illinois Tools Ltd.
Toronto, Ontario

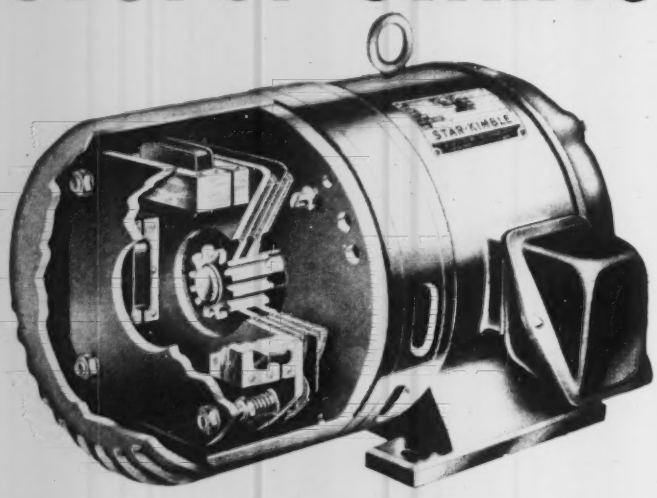
STOP! START STOP! START STOP! START STOP!

START STOP! START STOP! START STOP! START

START STOP! START STOP! START STOP! START

Instantaneous Drag-free

STOPS! STARTS



STOP! START STOP! START STOP! START STOP!

minute after minute YEAR AFTER YEAR
with Star-Kimble Brakemotors

That extra-large brakelining area you see brings a Star-Kimble Brakemotor and its connected load to an *extra-fast stop*—as short as a fifth of a second from full speed to standstill if desired.

And the small air gap contributes to *equally fast starts*. Brake is released the instant motor current is switched on—equipment starts without drag.

That's the story of a *single* Star-Kimble stop-start cycle. And the experience of user after user *proves* that Star-Kimble Brakemotors *maintain* the same split-second stops, the same smooth starts, through hundreds of thousands of cycles. In reversing service, conventional plugging methods with a typical 5 hp motor allow only 3 starts per minute. With a Star-Kimble Brakemotor, the figure is boosted to 10!

Of course, every Star-Kimble Brakemotor is a compact, integral unit designed to save space—and give rugged, dependable performance. One manufacturer—one responsibility.

For the full story, write for Bulletin B-501-A

STAR-KIMBLE
MOTOR DIVISION
MIEHLE PRINTING PRESS AND MFG. CO.
220 Bloomfield Avenue Bloomfield, New Jersey

This gondola carload illustrates sheet scrap and strapping material all of which should be bundled

is notified through the purchasing department and every effort is made to have the dealer visit the mill and see why his scrap is being rejected.

Two Types of Charges—In order to utilize purchased scrap more effectively, two distinct types of charges have been used since July, 1951, the practice being based on several years prior experience using "special" charges. One type charge contains a minimum of baled sheets and miscellaneous scrap for the higher quality steel grades demanding low residual alloy content while the second type charge allows larger amounts of purchased scrap for lower quality steel requirements.

This practice, however, forced a substitution of a portion of No. 2 baled sheets by more desirable scrap, resulting in an increased inventory of scrap considered to be undesirable with regard to both physical characteristics and residual content. Monthly average copper, tin and sulphur contents of heats made using Type I and Type II charges are plotted in Table 1.

Two significant conclusions can be made from the data: (1) Establishing two types of charges results in lower residual element content of heats produced from better quality scrap. This is necessary at the present time for producing high carbon wire heats intended for rope wire, tire bead wire, and spring wire and will become even more important in the future; (2) Dealer bundles and miscellaneous scrap are still in need of closer inspection in the yards of some deal-

It's outstanding!

EVERY MANUFACTURER who tries Roebling high carbon flat spring steel discovers the same thing . . . that this spring steel is absolutely unexcelled for dimensional and mechanical uniformity . . . for speeding production and cutting down rejects.

You always *pay* for the best when you buy flat spring steel . . . make sure you *get* it by specifying Roebling. John A. Roebling's Sons Corporation, Trenton 2, N. J.

ROEBLING

A subsidiary of The Colorado Fuel and Iron Corporation

Empire State Building, world's tallest building.

BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 KNEDLER AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 815 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1240 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

PHOTO BY RC MANUS

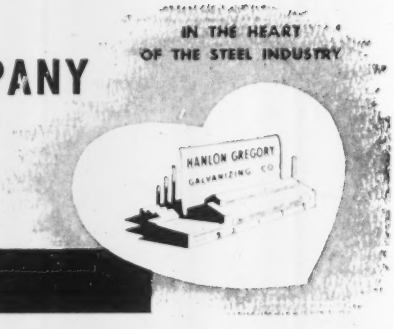
Just as a goalie needs protection...

IRON and STEEL
***Need* PROTECTION**

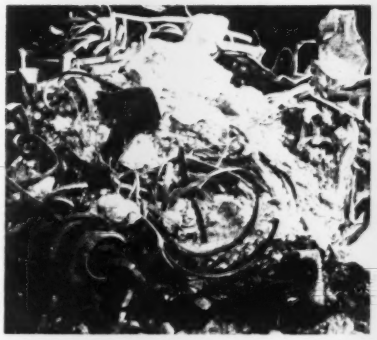
If your product is made of iron or steel, and exposed to the elements, protect it against the ravages of rust by Hot-Dip Galvanizing the best possible rust preventive when applied by Hanlon-Gregory. For longer life, greater uninterrupted service and substantial savings in maintenance, specify Hot-Dip Galvanizing . . . SEAL IT IN ZINC.

HANLON-GREGORY GALVANIZING COMPANY

Pittsburgh, Pennsylvania
The World's largest Job Galvanizing Plant



galvanizing . . . pickling . . . painting . . . oiling



Bales sometimes came in loaded with nonmetallic material to make weight. This one contained a core of concrete

ers for removal of nonferrous and nonmetallic materials.

The Pay Off—Results of the scrap improvement program begun in 1951 are presented in the series of graphs, Table II. The importance of scrap preparation on economic control of the steelmaking process is emphasized in the curves showing increased net tons produced per furnace operating hour (charge to charge time), and conversely, the decreased hours per heat and charge cars required per heat.

The first two curves reflect the increased production rate due only partly to improved scrap preparation, since a program to improve furnace firing practice has also been conducted during the last two years, and some of the increased production rate shown is attributed to this factor. The second curve shows that more than one and one half hours have been cut from the heat time since the program was started in 1951.

Reasons for this reduction in average heat time (1) Decrease in the number of charge cars required per heat from 28 to 23, representing 15 minutes; (2) Decrease in bottom repair delay time, due to more uniform scrap and to better segregation of such nonferrous materials as lead and babbitts; (3) Decrease in per cent of purchased scrap charges from a high of 43 per cent in 1951 to 32 per cent in 1953, although this factor may have only a slight effect; and (4) Improved furnace firing practice.

From paper presented at AISI Regional Technical Meeting, San Francisco.

World's largest stocks of

52100

STEEL TUBING and BARS

TUBES — Warehouse and mill shipment with more than 200 seamless tube sizes to choose from .950" O. D. to 8.750" O.D.

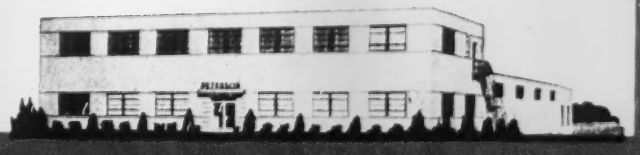
BARS — In sizes from .171" round to 8.750" round. Warehouse and mill shipment.

WIRE — Mill shipment of hot rolled or cold drawn ball, roller and needle wire.

FORGINGS — Quick shipment of all analyses.

Write for the latest stock list

Contact our nearest office or write to Peterson Steels, Inc., Springfield Road, Union, New Jersey. Address: Dept. S.

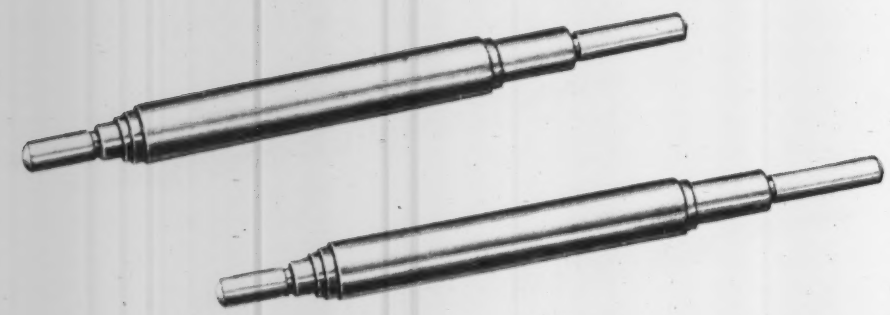


PETERSON STEELS, INC.

UNION, NEW JERSEY

Detroit, Michigan • Chicago, Illinois

2 Stainless Parts . . . *look alike*



but with 1 of them

The job becomes profitable

This main shaft for a fishing reel was anything but sport for the manufacturer. The steel used had to have excellent corrosion resistance, concentricity, close and uniform tolerances as supplied, and good machinability. With ordinary Type 416 Stainless, the Company just couldn't produce the shafts at a profit. But when the manufacturer made just *one* change . . . to Carpenter Stainless No. 5 (Type 416) . . . the profit picture changed completely.

Tool breakage is eliminated

Another problem when the ordinary Type 416 Stainless was used, was a serious rate of tool breakage. And here again, just one change . . . to Carpenter No. 5 . . . eliminated this headache.

All requirements are met

With Carpenter No. 5, the manufacturer now reports that *all* requirements are met and the shafts are coming off the line at a good rate. Here's just one more example of the difference Carpenter builds into stainless steels. Specify *Carpenter* on your next stainless order and see the profitable difference all along the line from initial operation to finished part.

Make the <u>one</u> change that counts . . .

change to *Carpenter*

Free-Machining Stainless

take the problems out of production

THE CARPENTER STEEL COMPANY, 139 W. Bern St., Reading, Pa.
Export Department: The Carpenter Steel Co., Port Washington, N.Y. — "CARSTEELCO"

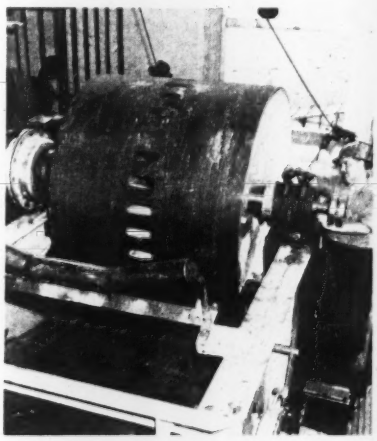
For fast delivery, call your nearest Carpenter Mill-Branch Warehouse, Office or Distributor

King Size Magnetic Pulley

This one removes all tramp iron from coal used in power station. New, thinner lagging helps

WHAT is probably the largest electro-magnetic pulley in the world was built recently by Stearns Magnetic Inc., Milwaukee. Unit is 60 inches in diameter with a 48-inch face.

Installed in the Oak Creek Power Station operated by the Wisconsin Electric Power Company, the pulley will magnetically remove all tramp iron from the coal used at Oak Creek, thus preventing damage to expensive crushers and other equipment.



KEEPS IRON OUT OF COAL BIN
. . . *magnetism saves crushers*

New Lagging—Unique feature of this pulley, other than its size is the new method of lagging that has been developed for this type of equipment.

Lagging, name of the material applied to the face of the pulley to increase its tractive effort for long conveyors, has been a problem to magnetic manufacturers because its thickness has reduced the effective magnetic strength of the pulley.

The company has pioneered in the application of a new lagging which is a thin, tough strip of material with firmly embedded granules that provides three times the traction of rubber lagging without belt wear and permits maximum use of the pulley's magnetic strength.

Industry's favorite floor "dry cleaner"

SOL-SPEEDI-DRI

No idle statement, that! For industry buys more Sol-Speedi-Dri than any other oil and grease absorbent. That's because pound for pound, dollar for dollar, Sol-Speedi-Dri gives *more for the money*, all factors considered. "Dry cleaning" with Sol-Speedi-Dri is *your* best way to keep floors clean and slip-proof. Send coupon today for free sample and literature.

SPEEDI-DRI CORP. **210 W. Washington Sq., Philadelphia 5, Pa.**

Warehouse stocks maintained in principal cities of the United States and Canada

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Inquiries in New York, New England and New Jersey should be addressed to Speedi-Dri Corp. Elsewhere in U.S. to Waverly Petroleum Products Co., 1734 Chestnut St., Phila. 3, Pa. In Canada, G. H. Wood & Company Ltd.—Toronto Branches throughout Canada

FREE SAMPLE Fill out the coupon and mail today for free sample and literature.

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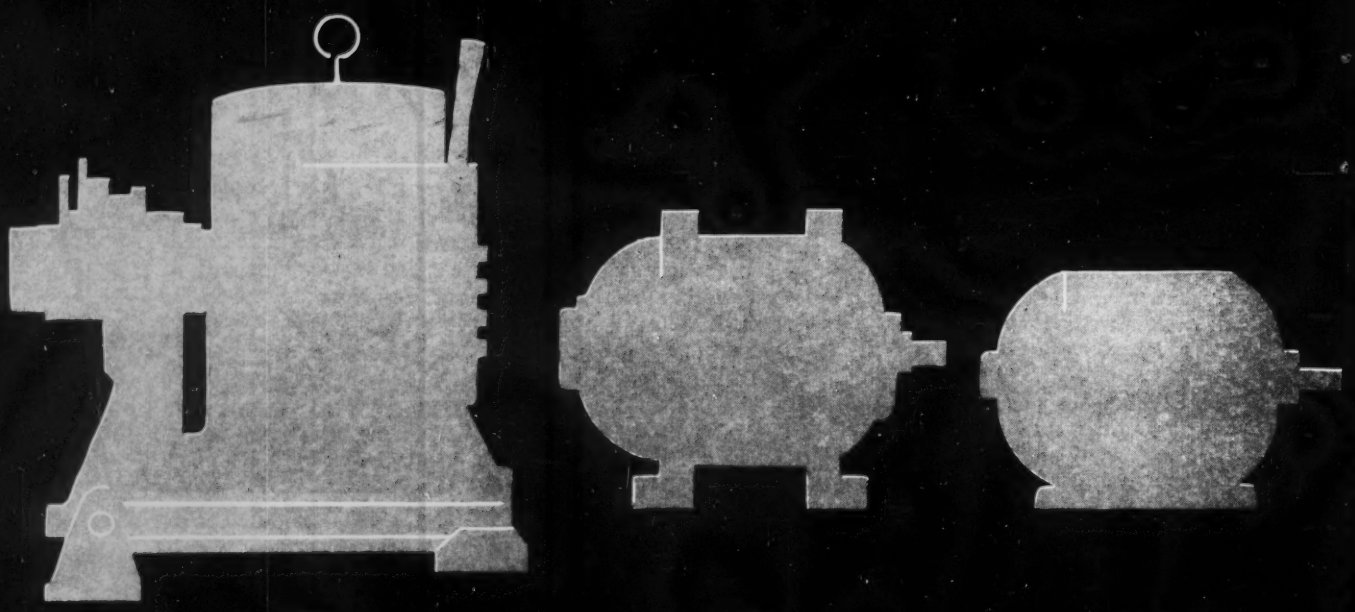
S-12-7-53

WHAT'S NEW IN MOTORS



1888
TESLA
5 H.P.
765 LBS.

1926
CS
5 H.P.
130 LBS.

1947
LIFE-LINE
5 H.P.
119 LBS.

IS STILL TO COME . . .

Hear anything about a new motor? Well, if you think you have, let's set the record straight . . . What's New In Motors Is Still To Come!

Westinghouse has been a leader in the designing and manufacturing of motors for over 60 years. During these many years, over 20 million dollars has been spent on the development of basic lines of induction motors to maintain this leadership. Here are the real years of "new motors" in the parade of progress:

1888—*THE FIRST A-C MOTOR—THE WESTINGHOUSE TESLA MOTOR*

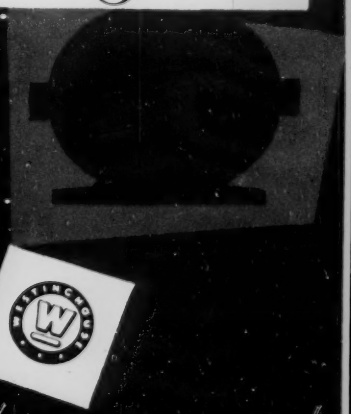
1926—*THE FIRST SEALED SLEEVE BEARINGS—THE WESTINGHOUSE CS MOTOR*

1947—*THE FIRST MOTOR WITH PRE-LUBRICATED BEARINGS PLUS A ⅓ WEIGHT AND SIZE REDUCTION—THE WESTINGHOUSE LIFE-LINE MOTOR*

The smaller, lighter Westinghouse Life-Line Motor of 1947 was the last major contribution. *AND FOR THE NEXT ALL-IMPORTANT STEP AHEAD IN MOTOR PROGRESS . . . LOOK TO WESTINGHOUSE.*

YOU CAN BE SURE.. IF IT'S Westinghouse

J-21834



Spray Pickler Installed

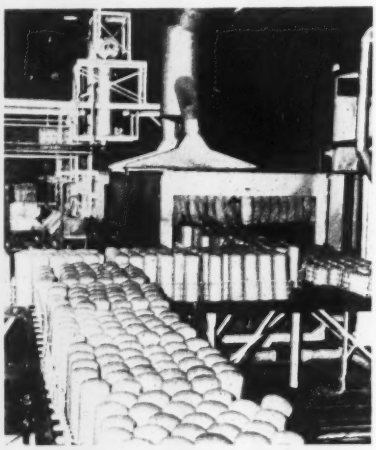
Unit takes scale and discoloration off brass shells after annealing operation

PICKLING MACHINE used for spraying brass shells with sulphuric acid has been designed and built by the Industrial Washing Machine Corp. of Matawan, New Jersey, and installed in the Waterbury, Conn., plant of Scovill Mfg. Co.

Brass strips are blanked into discs which are formed into a cup shape by a cupping press. After this operation, brass cups must be annealed before they can be redrawn. Annealing process leaves scale and discoloration on the shell and the pickling machine removes it.

Compact Unit—Live roller conveyor moves the 28-inch square wire mesh baskets containing the shells through three sections of over-and-under sprays. First set of sprays contains a solution of sulphuric acid; the second two are rinses. This bath removes the discoloration without affecting the shell itself.

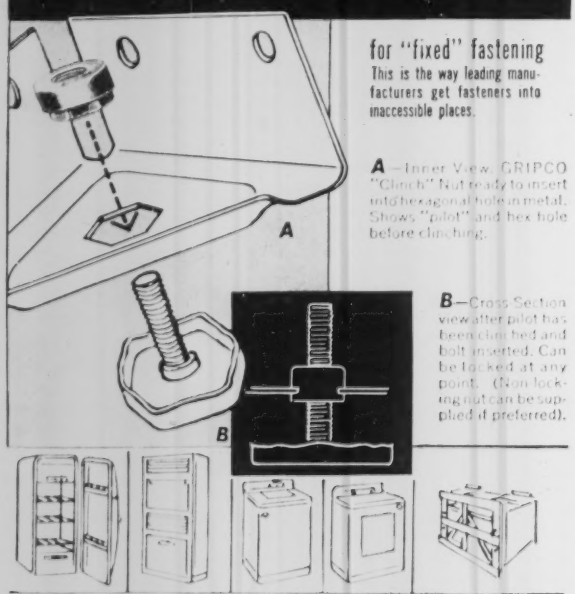
Although the Industrial Washing Machine Corp. designed the pickling machine to have a high capacity—15 square feet of work surface per minute—it is compact, being only 25 feet long, 10 feet wide and 6½ feet high. It is made of Type 316 stainless which has high resistance against the corrosive effects of sulphuric acid.



BRASS SHELLS GO TO CLEANERS
. . . spray pickler is speedy

how appliance manufacturers use

GRIPCO "CLINCH" NUTS IN "BLIND" ASSEMBLIES



for "fixed" fastening
This is the way leading manufacturers get fasteners into inaccessible places.

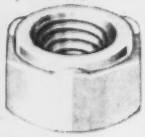
A—Inner View. GRIPCO "Clinch" Nut ready to insert into hexagonal hole in metal. Shows "pilot" and hex hole before clinching.

B—Cross Section view after pilot has been clinched and bolt inserted. Can be locked at any point. (Non-locking nut can be supplied if preferred).

● Makers of washers . . . dryers . . . refrigerators . . . ranges . . . freezers . . . room air conditioners and many other appliances are enthusiastic over these new and better fasteners—Gripco "Clinch" Nuts. In many cases they do a double job—*first*, to hold the product rigid and safe in its container during shipment, with no risk of bolts "backing out"—and *second*, for holding the adjustable "levelers" after the appliance is delivered to the user. If you have any application with hard-to-get-at fastening or that needs additional threading depth for applying bolts to thin metals, investigate Gripco "Clinch" Nuts.

Where Welding is Available—You may prefer to use

GRIPCO Pilot Projection Weld Nuts



Circular pilot accurately positions nut in the bolt hole, for resistance welding. No jigs necessary. Two pilot heights for different gages of metal.

or GRIPCO Countersink Weld Nuts

The special countersink feature eliminates the possibility of hot metal particles lodging in the threads; thus no retapping is necessary.

6-Point Security Against Fastener Failure

GRIPCO LOCK NUTS

1. Firmly lock on to bolt at any position.
2. "Stay put" on bolt, in spite of vibration, tension, etc.
3. Positive locking action not due to any outside devices, but result of simple vertical thread deflection.
4. Oil or water do not affect Gripco locking action.
5. Can be removed with a wrench and reapplied repeatedly without loss of locking action.
6. Cost less because of simple design.

LET GRIP NUT HELP SOLVE YOUR FASTENING PROBLEMS

Write for samples, mentioning types and sizes of nuts you use. 460-S

GRIPCO **GRIP NUT COMPANY**
308-N S. Michigan Ave., Chicago 4, Ill.

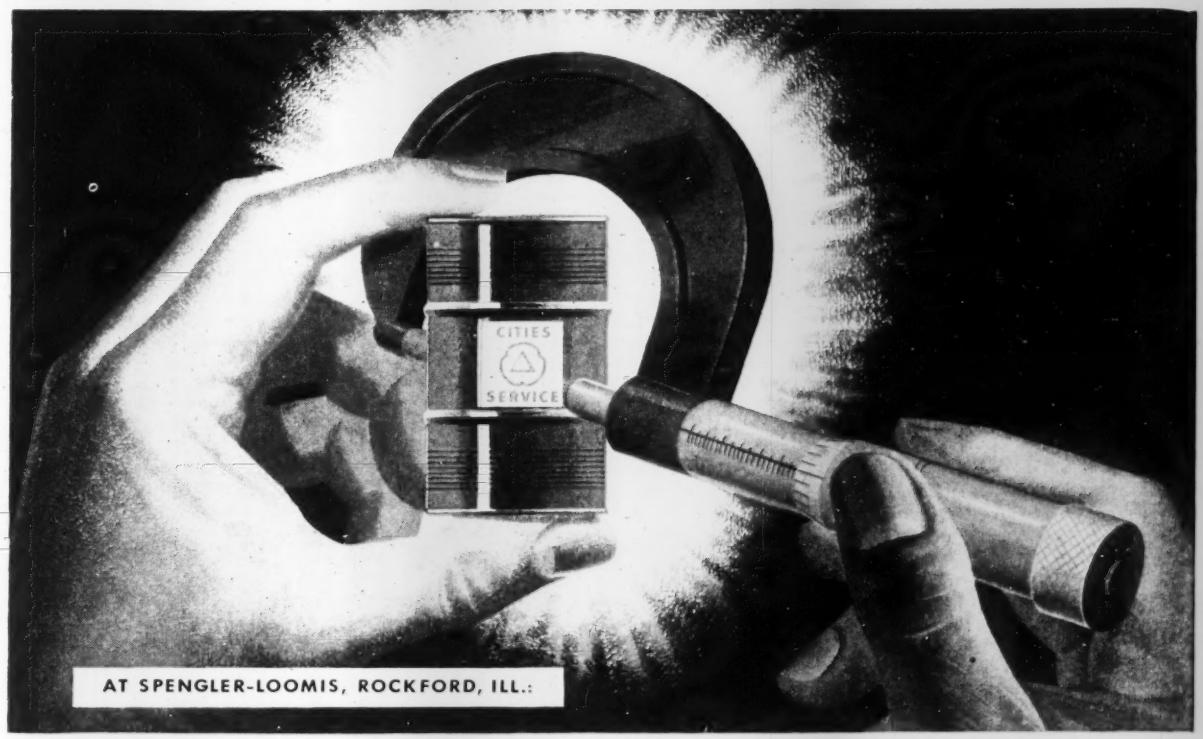
Standard Thread Inserts

Military standard sheets have been issued covering helical coil wire thread inserts (National Coarse and National Fine series) for aircraft applications.

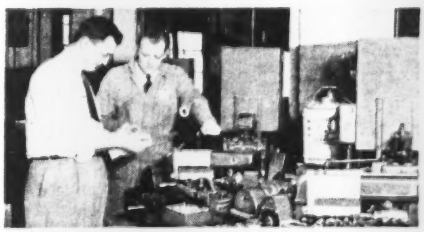
Separate sheets list nominal lengths of 1, 1½, 2, 2½ and 3 diameters. Maximum and minimum tolerances are established for all characteristics of the inserts. Thread diameters range from .164-32 to 1.000-8. Since the inserts can be supplied notched for tang-breakoff in through holes, or unnotched for use in blind holes, separate part numbers are assigned to the notched and unnotched inserts.

These military standards were developed with the engineer and propeller utility parts committee of the Society of Automotive Engineers.

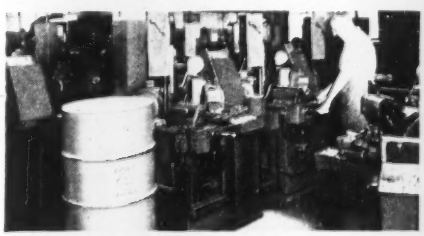
Copies of the Military Standard Sheets are available upon request from Heli-Coil Corporation, 1435 Shelter Rock Lane, Danbury, Conn.



Cities Service Cutting Oils Proved The Very Best By Micrometer Test!



CUTTER MEASURED WITH MICROMETER. As a final test, Automatic Pencil Sharpener measures each cutter with a micrometer. All tests proved that Cities Service cutting oil was absolutely tops for this really tough job.



STRICT SPECIFICATIONS REQUIRE FINEST CUTTING OIL. APSCO Sharpeners offer many more features than other brands. To produce their top quality product, Spengler Loomis relies on top quality lubrication products — Cities Service Products, famous throughout industry.

ONLY .005 INCHES BURR OR BUILD-UP ALLOWED IN FIFTY-HOUR OPERATION CUTTING GROOVE IN B1112 STEEL!

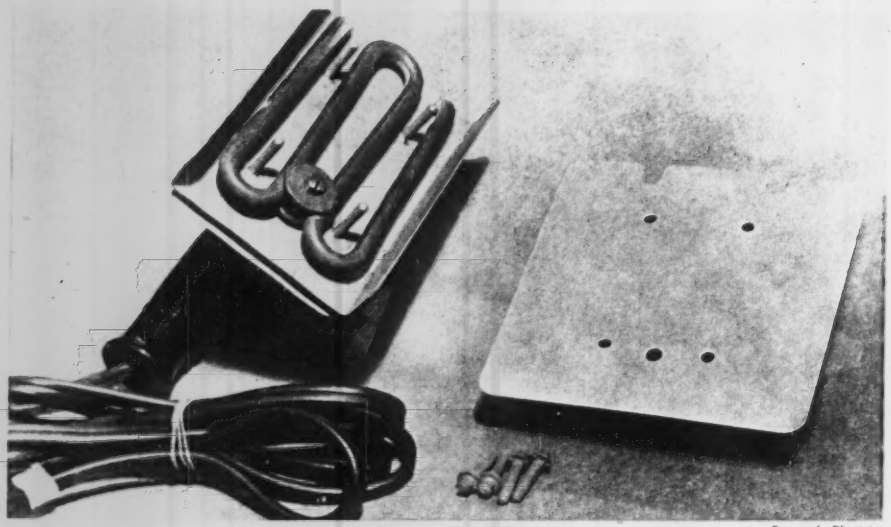
Says Mr. C. J. Kostrzewa, Plant Superintendent: "Cutting oil requirements in our Automatic Pencil Sharpener Division are tough. To find the right coolant, we called for, and tested, samples from various companies. Over a period of testing time, we used graphs, charts and tables, keeping a running record on all coolants. As a final test, we measured the cutter with a micrometer before and after milling. The cutting oil that came out tops was Cities Service.

"I'd also like to point out that the Cities Service Engineering staff co-operated fully by offering helpful advice and excellent service."

Why not discuss your lubrication problems with a Cities Service lubrication engineer? Write Cities Service Oil Company, Dept. L.18, Sixty Wall Tower, New York 5, New York—or contact your nearest Cities Service office.

CITIES SERVICE
QUALITY PETROLEUM PRODUCTS

By RICHARD L. WACHTELL
Technical Director
Chromalloy Corp.
New York



Chromized shield and weld pins (right) go into the paint remover (left). The pins are projection welded into place

General Electric

Putting Chrome on Ferrous Surfaces

Iron and chrome atoms trade during high temperature reaction. Chromized case is true alloy layer that does not spall, peel or flake. Dimensional changes of work are slight

YOU can "rebuild" surfaces of ferrous metals (trading iron for chromium atoms) for resistance against heat and erosion, wear and abrasion or corrosion.

During the high temperature exchange reaction, chromium diffuses inward to form a true alloy layer that does not spall, peel or flake and dimensional changes in work are slight, according to Chromalloy Corp. of New York.

Not to be confused with electroplating, the Chromalloy process can develop a ductile case (0.006 inch) of chromium on low carbon steel or a thin (0.0007 inch), extremely hard (VPN 1800) chromium carbide case on steels of medium to high carbon content.

If research lives up to expectations, chromizing also will be extended to powdered iron parts to improve physicals and corrosion resistance.

Scope—Ductile cases, generally speaking, are designed to do the job of 400-type stainless steels. Economy, of course, is on their side, and since the outer layer may run as high as 50 per cent chromium, they also may outperform conventional chromium stainless. Chromacarb case, the hard coating, is noted for wear properties.

Process may be used effectively at any stage of manufacture—from processing original stock before forming to treating finished parts prior to packing for shipment.

Considerations—This is a pack process; so cost will be proportional to space occupied by work in retort—hollow structures, for example, having a high volume-weight ratio have a high cost-weight ratio. If coating is ductile, chromizing of blanked sheets is frequently recommended.

Layers are usually thin and highest chromium content is at the outer surface of the layer. Thus surface finishing is not recommended after chromizing. Case has a silvery grey finish.

Since process is a high temperature one, cooling is slow. Parts emerge in dead-soft, fully-annealed condition. If heat treatment is required, it may be done after chromizing in a neutral or reducing atmosphere.

Joining — Spot, seam or stud welding are preferred methods of joining and fastening. Riveting and staking are satisfactory, especially if rivet holes are punched before chromizing. If not, shaft and head of rivet shield unprotected edge of hole fairly well. Stainless or chromized rivets are preferred.

Fusion welding (hand or automatic, inert gas shielded or conventional) is possible, but special pains must be taken to avoid exposure of unchromized base metal. Of course, stainless welding rods should be used. Brazing requires fluxes and rods for stainless steel.

Welded or riveted assemblies can be chromized without risk of bleeding, but areas shielded from the pack (as the inner faces of lap joints) get inferior protection. Braze metal is a stop-off for chromizing (brazed areas will not chromize and copper brazing is necessary to stand up under high processing temperature).

Forming—Ruling out grinding and machining, chromized metal can be formed by virtually any process. Chromized sheets can be stamped, bumped, crimped and drawn without impairing integrity or adhesiveness of layer; wired or beaded edges may be formed, permitting the shielding of part edges blanked from chromized sheet; and swaging is possible.

Of course, care should be taken to keep tools as smooth as possible. As a matter of conservative policy, maximum radii possible are allowed.

Powder Metallurgy — Applications are being investigated by the Lionel Corp., Irvington, N. J. Tensile test bars (pressed from iron powder at 30 psi) have been sintered at 2050 F, then chromized, while others are chromized without sintering.

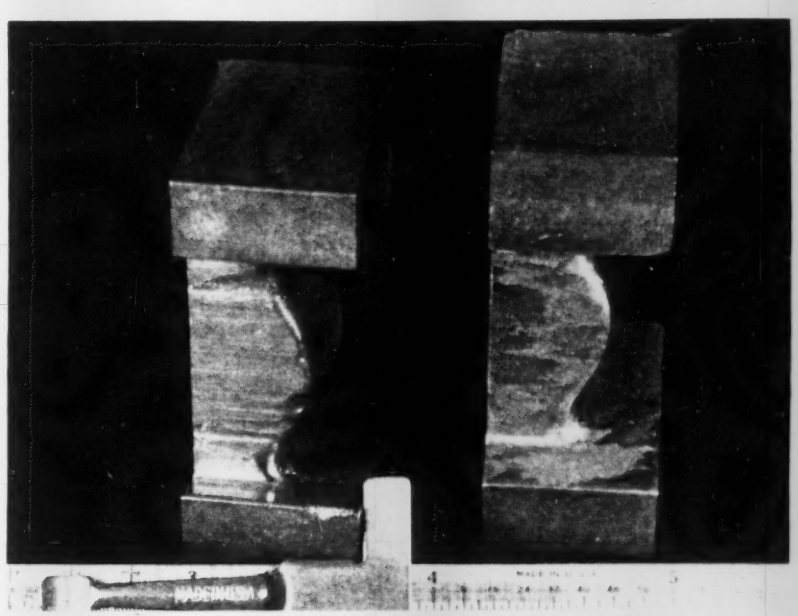
Properties in both cases have been about the same. Tensile strength is increased from 17,800 to 27,225 psi, elongation from 6 to 11 per cent.

Other Applications — General Electric Co. has been one of the leaders in heat resistant applications. It uses the process in the manufacture of strip heater casings and Calrod tubular heaters. Test: 1000 hours at 1200 F.

Tubular heaters are chromized after insertion of heating element and magnesium oxide powder insulation. With strip heaters, casing is given treatment prior to installation of heating element and insulating powder. Casing is then compressed and ends are crimped.

In tubular heater production, swaging to final size can take place after chromizing. This permits use of smaller retorts and furnaces.

Some possible applications: Exhaust manifolds, mufflers and tail pipes for internal combustion engines and chimney flue pipe.



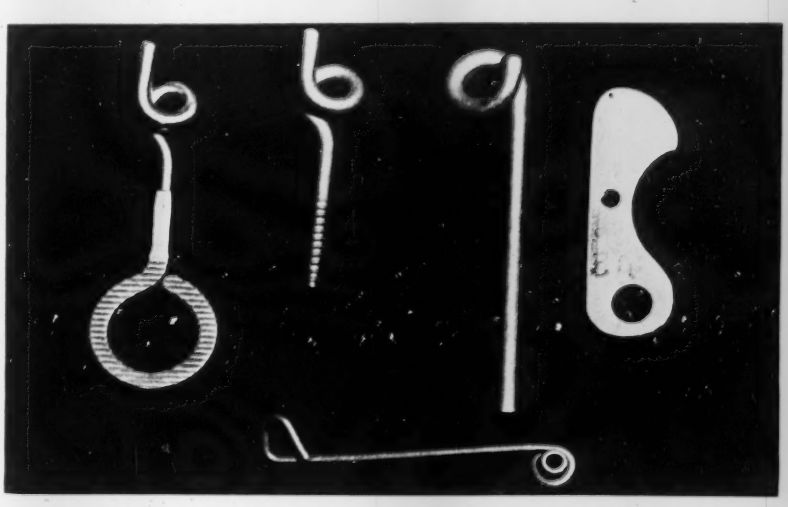
Wiping dies for forming type 430 stainless steel. Die on right (it has formed 100,000 pieces) was Chromacarbed, then heat treated. The aluminum bronze die on left shows deep wear groove after 3000 pieces were formed

Wear and Abrasion—There is a wide range of applications here. In the field of metal-to-metal wear, for instance, a unique spiral hack saw blade owes much of its growing success to its Chromacarb surface. It is heat treated after processing. Experimental work is under way on twist drills, conventional hack-saw blades and files. Zipper forming dies and upsetting dies also have shown promise in initial experimental work.

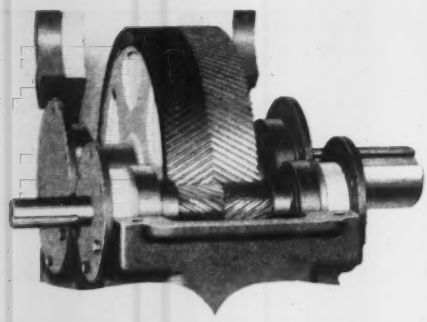
Corrosion—This aspect of the process is widely exploited abroad. Applications include dough mixers for bakeries, fire engine pump fittings and washing machine parts. In this country, most applications are still in the experimental stage

work includes fittings, elbows and flare tubings for jet engines.

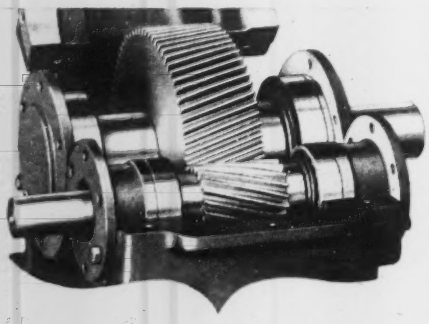
Obvious saving is that chromized metals can be substituted for solid stainless. Superior wear resistance is an incidental benefit.



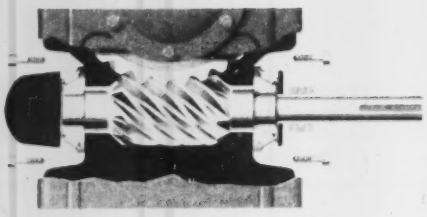
Treated high carbon steel guides for textile machinery can outwear hard chrome plating by as much as 20 to 1 and are roughly competitive in cost



A Complete Line of Speed Reducers



HERRINGBONE · HELICAL · WORM GEAR



for Unbiased Selection of Type

• Horsburgh & Scott Speed Reducers are available in 3 general groups, 12 distinct types in many sizes and hundreds of standard ratios. Many considerations, such as speed of driving and driven shafts, shape of housing and characteristics of drive, point definitely to one specific unit as the best drive for a particular duty. Having such a complete line to select from, engineers have exceptional freedom for unbiased selection of the right reducer for the job.

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVE. • CLEVELAND 14, OHIO, U.S.A.

Send note on Company Letterhead for Speed Reducer Catalog 46

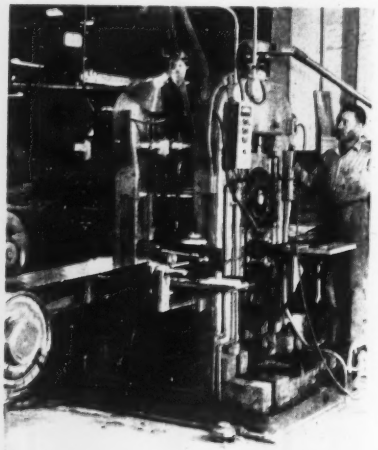
Better Roll Tolerances

Mill rolls to plus or minus 0.0003-inch. Three interlocked additions do the trick

INSTALLATION of new control and gaging system to their 4-high rolling mill permits Eastern Brass & Copper Co., New York, to roll to extremely close tolerances.

What Eastern engineers wanted was more tension, automatic regulation of the tension and continuous close gaging of the coil as it passed through the mill.

The System — Working with Westinghouse engineers, designs were drawn up, based on an electronic system. A tension block permits constant tension up to



ELECTRONIC TENSION CONTROLLER
. . . gives closer tolerances

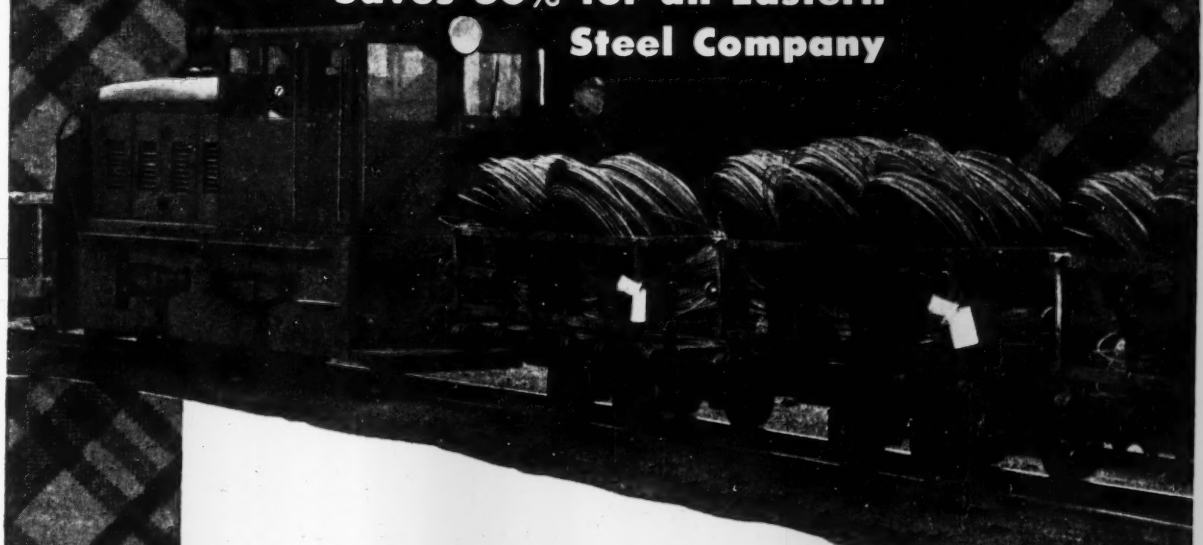
2000 psi. By thus increasing the pull on the rolled material, the block substantially eliminates ripples and camber.

A series of electronic controls guarantee absolute uniformity, regulating the tension as the coil of metal builds up. A continuous magnetic gauging instrument, specially designed for rolling mills by Pratt & Whitney, measures variations in thickness up to 0.0001-inch.

Conjunction of these components now permits the 4-high, which handles coils up to 12½ inches wide, to roll aluminum, steel, brass, and copper to tolerances of plus or minus 0.0003 inch.

This Thrifty Baldwin

Saves 60% for an Eastern Steel Company



Typical of the performance records of thrifty Baldwin industrial locomotives is a report from an eastern steel company, where a Baldwin diesel switcher is employed in materials handling averaging 120 tons a load.

"We can take in *one* trip, materials that previously may have required 2 to 3 trips to transport from one part of our plant to another."

This represents a saving in materials handling costs of approximately 60% by using a Baldwin diesel to do the job.

This steel company also reports: "Maintenance has not been a problem."

"From the standpoint of handling ease, the diesel locomotive is safer and easier to operate."

Because Baldwin industrial locomotives are thrifty . . . representing more economical materials handling, lower maintenance, greater operating flexibility . . . they can check mounting haulage costs in your plant.

If *you* are interested in more economical switching operations, write today for Bulletin DMH-300 to:

Dept. 1016, Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.

BALDWIN BLH LIMA-HAMILTON

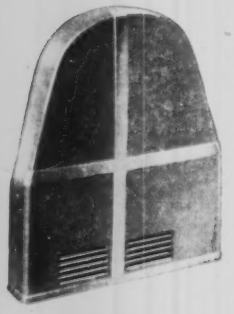
BALDWIN-LIMA-HAMILTON

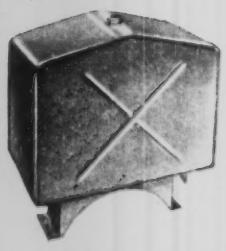
INDUSTRIAL LOCOMOTIVES

...they're thrifty!

SHEET METAL FABRICATION

by KIRK AND BLUM





- Tanks • Spare Parts, Boxes
- Machine Bases, Pedestals & Frames
- Panel Boards • Electrical Enclosures
- Hoppers • Guards • Stampings
- Rolled Steel Rings • Pans • Racks
- Louvre Panels • Cabinets

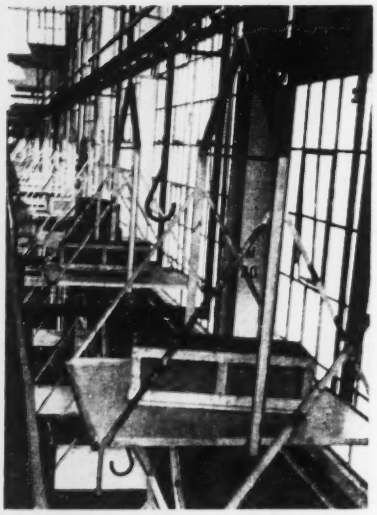
With 46 years of experience in the field, KIRK & BLUM offers quality workmanship, economical fabrication to the most exacting specifications . . . large or small quantities. Complete facilities to ½" capacity for shearing, braking, forming, rolling, punching, riveting, welding, grinding, drilling and finishing.

Whatever your requirements, KIRK & BLUM facilities are at your service.

Write for literature on fabrication facilities or send prints for estimate to: The Kirk & Blum Mfg. Co., 3226 Forrer Street, Cincinnati 9, Ohio.

ASK FOR BOOKLET: "SHEET METAL ASSEMBLIES" 40-Page booklet shows typical examples of Kirk & Blum fabrication for jobs ranging from one unit to thousands.

KIRK AND BLUM
METAL FABRICATION



TROLLEYS EASE MATERIAL FLOW
. . . eliminate truck haulage, elevators

Aircraft Assembly Boosted

OVERHEAD CONVEYOR belt, 6600 feet long, has been installed in Pratt & Whitney Aircraft's main plant in East Hartford, Conn. It is powered by three individual motor drives that push it along at a rate of 30 feet a minute.

Company engineers who designed the belt about a year ago expect it to greatly increase assembly efficiency by eliminating most of the elevator and other inside trucking. Manufacturer was Jervis B. Webb Co., Detroit.

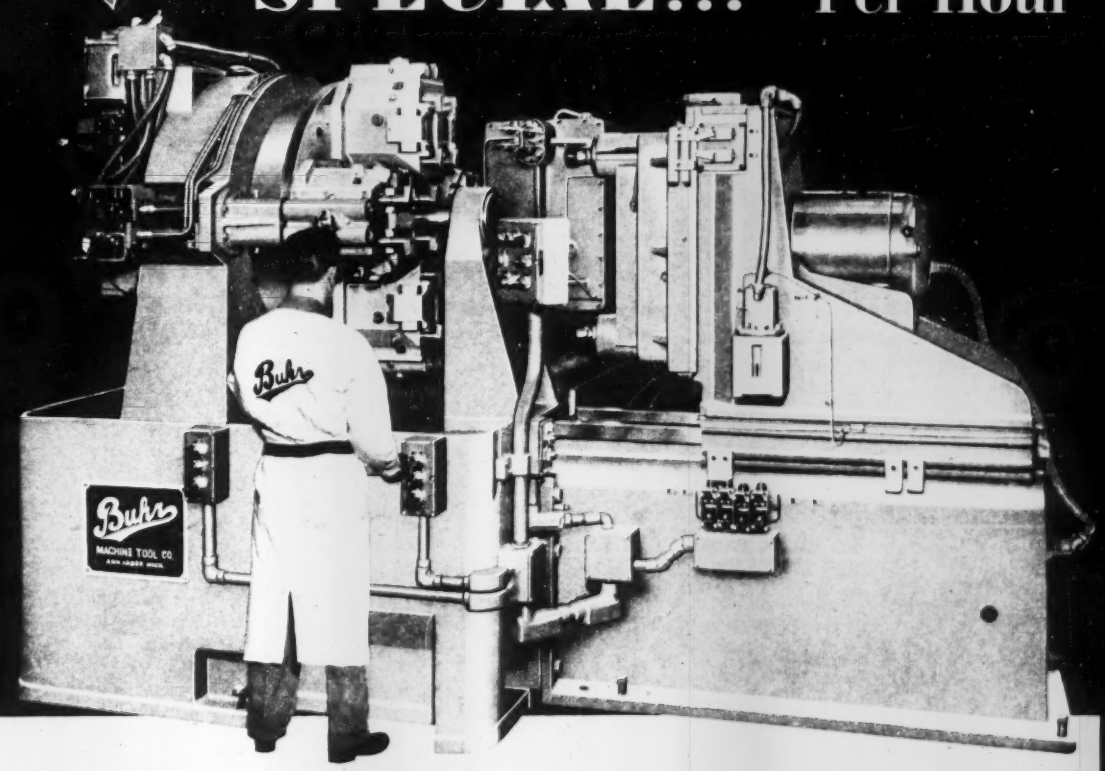
Station Communication—Eleven strategically located loading and unloading places serve as stopping points along the length of the conveyor. Continual motion is emphasized by a single control switch located at one end of the belt.

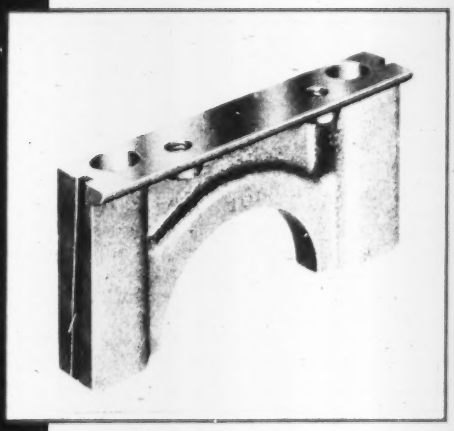
Steady speed allows material to be placed on and removed from the machine while it is in motion. Large trays, used to carry material, are suspended from the moving cable and numbered consecutively so telephones at each station can be utilized to inform points further along the line to be on the lookout for material.

Passes Test — Trial runs have been successful since the belt was first put in operation several weeks ago. The materials handling department at P & W A, which had much to do with design and installation, feels that the conveyor will give a 100 per cent improvement over old transportation methods.

Buhr SPECIAL...

Mills and taps 510 Oil Seal Retainers Per Hour





Fixture is arranged with hydraulically operated automatic clamping and automatic index.

Operation: Loading two parts. Station 1 — Load and Clamp.
Station 2 — Tap (2) 5/16-18 Holes and mill two Slots.
Station 3 — Idle.
Station 4 — Tap (2) 5/16-18 Holes and mill two Slots.

As with all Buhr Specials, fixtures are completely interchangeable, hydraulic and electrical installations to J.I.C. Standards, tool steel laminated, hardened and ground ways. Automatic lubrication throughout Machine.

BUHR MACHINE TOOL CO.
ANN ARBOR, MICHIGAN

Buhr
MULTIPLE-SPINDLE
HIGH PRODUCTION MACHINERY

WHY IT PAYS TO BUY STEEL FROM WAREHOUSE

You don't need to freeze money in inventory!

WHEN YOU BUY STEEL FROM WAREHOUSE, YOU GET:

- LOWER INVENTORY COSTS
- LOWER SPACE COSTS
- LOWER TIME COSTS
- LOWER CAPITAL INVESTMENT
- FASTER PRODUCTION
- FEWER INVENTORY LOSSES

LET your U. S. Steel Supply warehouse serve as your inventory stock. Then you eliminate from your overhead the cost of carrying your own inventory, and free a substantial portion of your capital for other purposes. U. S. Steel Supply can always deliver the steel you want to your plant or job site at the time you specify. Just tell your U. S. Steel Supply salesman what you want . . . when . . . and where.

U. S. STEEL SUPPLY

DIVISION

General Office
208 So. La Salle St., Chicago 4, Ill.

USS

Warehouses and Sales Offices Coast to Coast

UNITED STATES STEEL

NEW PRODUCTS and equipment

Reply card on page 169 will bring you more information on any new products and equipment in this issue

High-Density Material

. . . practically pure tungsten

A high-density material which is practically pure tungsten, with small amounts of nickel and copper added to aid machinability, has specific gravity of 17.5 to 18.2. Termed Heavy Metal by the manufacturer, it has tensile strength of a good quality steel.

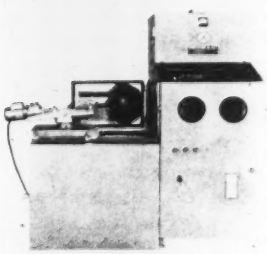
Typical applications include counterweights, balancing weights, radium caskets, x-ray tube screens, electrical contacts and anvils for hot extrusion and upsetting. Firth Sterling Inc., Dept ST, 3113 Forbes St., Pittsburgh 30, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 1

Wet-Blasting Model

. . . for bulk, small-parts work

Addition to this manufacturer's line of wet-blasting equipment, the Pressure Blast Roto-Barrel, is built for bulk, high-production finishing, cleaning or deburring of small parts. Good examples are found



in its work on screw machine products, stampings, small castings and extrusions.

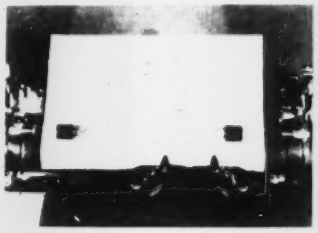
Work is loaded into the expanded metal, plastisoled barrel and rolled into cabinet interior where the blast gun, in a fixed but adjustable position, aims in the open end. A variable speed drive rated at 0 to 78 rpm rotates the barrel, exposing parts to the blast stream. Following wet blasting, barrel is rolled out of the cabinet manually and work is rinsed free of abrasive slurry at the machine. Cro-Plate Co. Inc., Dept. ST, 747 Windsor St., Hartford, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 2

Transparent Typewriter Bail

. . . eliminates blind spots

Available for all standard typewriter makes, this transparent bail lets the typist see work clearly as it is being typed. Its effect is



to save time by eliminating blind spots, doing away with the need for lifting the bail to see what has been completed. Scale on the transparent See-Thru bail is available far pica or elite type. Maroth-Kennedy Corp., Dept. ST, Two Oak Ridge St., Greenwich, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 3

Mass Material Hopper

. . . at work-level position

Mass material supply at work-level position is provided by this addition to the Work-O-Matic system of handling equipment. The gravity-fed hopper is portable, has 47.2 cu ft capacity. When a loaded drop bottom box is stored under the hopper, total vertical material supply volume at the work station is increased to 67.4 cu ft.

Hopper can be fork-lifted easily to different work stations. A fork truck can drop-bottom dump contents of the box into the hopper from any one of eight directions.

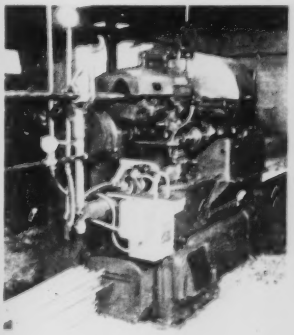
Adjustable, vertical control gate governs material flow according to piece size. Union Metal Mfg. Co., Dept. ST, Canton, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 4

Hydraulic Machine Feed

. . . eliminates feed marks

Attachment for feeding screw machine stock is reported to achieve rate increases under pro-



duction conditions. The Hydra-Lite attachment speeds stock handling, also reduces many subse-

is

coil-itis* increasing your temperature problem?

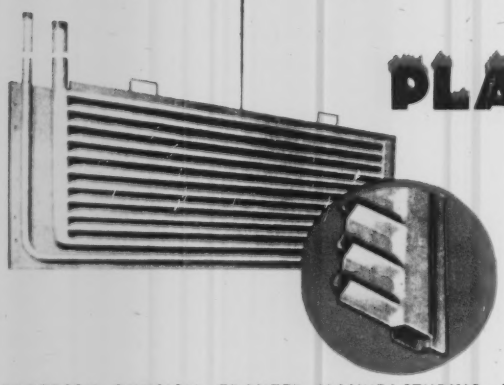
Here is a new treatment for solving your heat transfer problems that is as revolutionary as a new wonder drug. It stops coil-itis* cold . . . It eliminates the many troubles that have plagued industrial heating and cooling practices due to the use of old-fashioned, outmoded pipe coils. This revolutionary new unit, called a Platecoil, heats or cools 50% faster and takes 50% less space in the tank. It simplifies maintenance and saves hours of downtime.

Write for bulletin P72 today!

PLATECOILS SAVE 50% IN HEAT TRANSFER COSTS

PLATECOILS COOL QUENCH OIL TANK FOR 1/3 THE COST

At the K-D Manufacturing Company, Platecoils are proving more efficient, yet cost only 1/3 as much to install. Ask about other case histories.



PLATECOIL

REPLACES PIPE COILS

*Coil-itis — Diagnosed as tank heating and cooling problems. Platecoils — the prescription for solving pipe coil problems.

PLATECOIL DIVISION, TRANTER MANUFACTURING, inc., LANSING 4, MICHIGAN

NEW PRODUCTS and equipment

quent operations because the hydraulic feed eliminates feed fingers that often score bars. Result is to make it possible to feed ground and polished bars without the usual scratches and mars that result in excessive scrap.

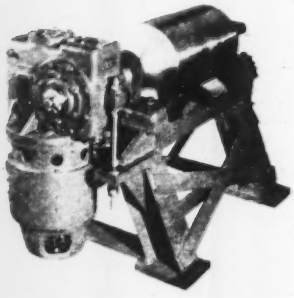
Another timesaver is a signal light that turns on automatically as the bar end approaches, enabling the operator to avoid delay in readying a new bar. Aurora Precision Devices Inc., Dept. ST, 318 Anderson Blvd., Geneva, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 5

Floating Table Gearmotor

. . . for mill roll tables

Gearmotor for aluminum and steel mill roll table operations differs from conventional flexibly-coupled, rigidly-mounted unit in that driving shaft is equipped with a sleeve section that permits direct mounting on the roll shaft extension. Gearmotor is provided with a torque rod to anchor the drive and prevent its turning, so



the whole drive rides with the roll.

Torque rod is spring-mounted for protection against severe shock loads caused by frequent reversals. Space normally required for motor and coupling connections is saved by using the hollow shaft mounting and turning the motor vertically downward. This conserves about 18 inches over the conventional

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

INFORMATION

AVAILABLE FOR THE ASKING

69. Plant Layout Templates

70. Hole-Punching Units

71. X-Ray Supplies

72. Industrial Rolls

73. Spherical Roller Bearings

74. Engineered Production

75. Vises, Positioners, Tools

76. Roller Chain

77. Die Steels

78. Power Cables

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Penton Building, Cleveland 13, Ohio

Please send literature or detailed information on subjects circled at left to—

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PRODUCTS MANUFACTURED

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2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
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7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
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79. Self-Dumping Hoppers

Roura Iron Works, Inc.—The fact that "you can save 50 per cent labor-time with Roura self-dumping hoppers" is brought out in 4-page illustrated bulletin PM 100. Design features are described, applications are shown and construction details are given. Sizes range from ½ to 2 cu yd.

80. Electrostatic Spraying

Ransburg Electro-Coating Corp.—The "what and how" of the Ransburg No. 2 process for electrostatic paint spraying are detailed in 16-page illustrated brochure. Wide variety of applications which result in savings in paint, labor, rejects, equipment and other factors are shown. Scope of the process is covered.

81. Fork Truck Torque Drive

Towmotor Corp.—"Presenting Another Outstanding Achievement in Towmotor Engineering" is an 8-page illustrated bulletin which describes the TowmoTorque drive for Towmotor fork lift trucks. Cut-away views and text show operation of the torque converter and relate its operational advantages.

82. Use of Rare Earths

Molybdenum Corp. of America—"Rare Earths in Iron and Steel Melting" is title of 8-page illustrated progress report No. 1. It describes and relates properties and applications for RareMeT compounds, metals and chemicals used in making of wrought steel, cast iron and cast steel.

83. Silicon Carbide Facts

Carborundum Co.—52-pages of loose-leaf book "Facts About Silicon Carbide" contain a wealth of information on the material, its formulation and properties, forms in which it is offered, and grain preparation. Products covered include loose grain and grinding compounds, bonded and coated abrasives, refractories, refractory cements, resistors and others.

84. Industrial Filter

Murray-Way Corp.—4-page illustrated bulletin presents operation method and capacities and other data on an automatic rotary industrial filter. Unit continually presents clean screen to the liquid to be filtered. Wide range of standard screen sizes is available.

85. Flat Cars

Atlas Car & Mfg. Co.—24-page illustrated bulletin 1283 describes walk-along safety type and other power operated flat cars for heavy duty materials handling. Units described have capacities ranging from 5 and 135 tons. Such features as battery operation with automatic charging and safety governor which prevent units from moving at faster than normal walking speeds are described, along with other details and specs.

86. General Tool Catalog

Chicago-Latrobe Twist Drill Works—In 152 illustrated pages, catalog No. 51 presents complete ordering information, technical data and use hints on an extremely comprehensive line of standard tools. This includes auger, power, router, tool and wood bits, carbide tools, counterbores, counter sinks and various drills, lathe accessories, metric and special tools.

EDITORIAL ARTICLES

Available in Limited Quantities

87. Weld-Free Strip

Slabbing was the bottleneck to longer, weld-free strip at Great Lakes Steel Corp., so company built a new 45 x 90 universal mill. It turns 20-ton flat ingots into strip for auto-builders. See STEEL article "Bigger Slabs Answer Strip Demands."

88. High Speed Tool

"How to Tell a Good High Speed Tool" when you see one in a microscope is graphically shown in photomicrograph chart submitted as STEEL article by M. J. Antus and B. L. Johnson of Latrobe Steel Co. Photos show what tool should and should not look like in relation to distribution of carbides, heat treated structure, surface condition and austenitic grain size.

89. Arc Welding

Progress in the art of welding has far outstepped full utilization by industry, however, situation cannot last for long in a tightening economy. Industry can't afford to use anything but the best method. In STEEL article "Pick the Right Arc Welding Method," by T. F. Hruby, Associate Editor, coated electrodes, submerged arc and inert gas-shielded arc methods are effectively discussed.

90. Job Shop Incentives

Representative problems and ways of developing a sound incentive wage plan are pointed up in STEEL article "Charting Incentives for Job Shops" by D. C. Latella, management consultant. Case history of job-shop, George D. Ellis & Sons, illustrates that success of the entire program often hinges upon the skill with which engineers perceive hidden pitfalls in one or a series of operations.

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12-7-53

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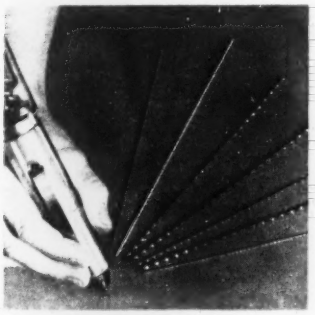
coupled drive. Westinghouse Electric Corp., Dept. TP-513, 200 McCandless Ave., Pittsburgh 1, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 6

Precision, Joined Screws

. . . stick feeds automatically

Screwstick is a one-piece stick of identical precision screws, each joined to its neighbor. To load, stick is simply placed in pneumatic, electric, spiral or hand-ratchet driver and the entire stick of screws feeds automatically. Device combines simplicity and speed of fastening with rivet-like strength. Eliminated is fumbling



and tedious handling of individual screws, regardless of size.

Screws are twisted off automatically and fastening is made when a predetermined torque is applied by the screwdriver to the screw following the one driven. Unit does not distort delicate parts, strip threads, leave fastening tightness to guesswork of man or machine. American Screw Co., Dept. ST, Willimantic, Conn.

FOR MORE DATA—CIRCLE REPLY CARD NO. 7

Optical Gaging Gear Analyzer

. . . no interpolative data

Gear analysis can be accomplished visually by optical gaging methods with this analyzer. Direct

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

NILSON FOUR-SLIDE

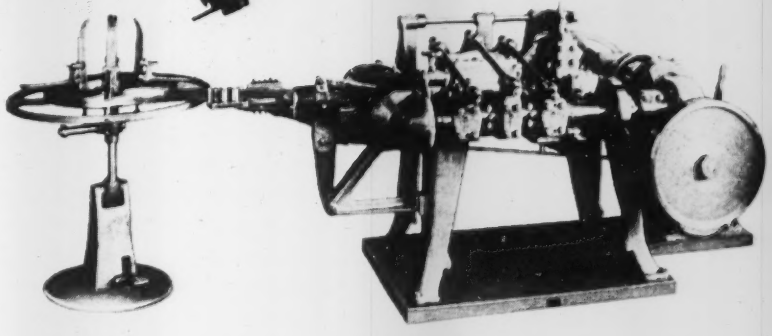
It's easy to get HIGH PRODUCTION . . . and UNIFORMITY, too!

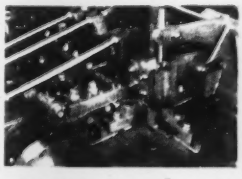
Wire and Ribbon Metal FORMING MACHINES

UNIFORMITY in automatic production doesn't come by chance! In the case of wire and ribbon stock forming on NILSON 4-SLIDES, *it means control of the material from the coil to the final form.*

Parts, such as illustrated, are produced to tolerances of .002 at critical dimensions. Dies and forming tools, once installed (faster and simpler with NILSON'S open construction) maintain close tolerances for short and long runs. One machine! One set-up! Increased production! Maximum uniformity!

Model SF3 NILSON 4-SLIDE, shown below, with No. 51B Tilting Stock Reel, is a complete unit that can be set-up in any convenient location.





Close-up of the NILSON forming section with the built-in Horizontal Press to the left. This design eliminates secondary handling and insures product uniformity because the sequence of stamping and forming is automatically controlled.

Close-up of the NILSON feed mechanism . . . capable of feeding wire and ribbon metal to tolerances of .001. Another important element in insuring product uniformity. Positive control is maintained over the material regardless the length of feed.

Range of sizes

Wire Forming
1/32" through ½" wire. Feeds up to 32".

Ribbon Stock Forming
1" through 1½" wide material. Capacity of press section 5 to 10 tons; 50 to 75 tons in heavy duty types.

For specific recommendations — send details of your operation.

THERE'S NOTHING LIKE A NILSON

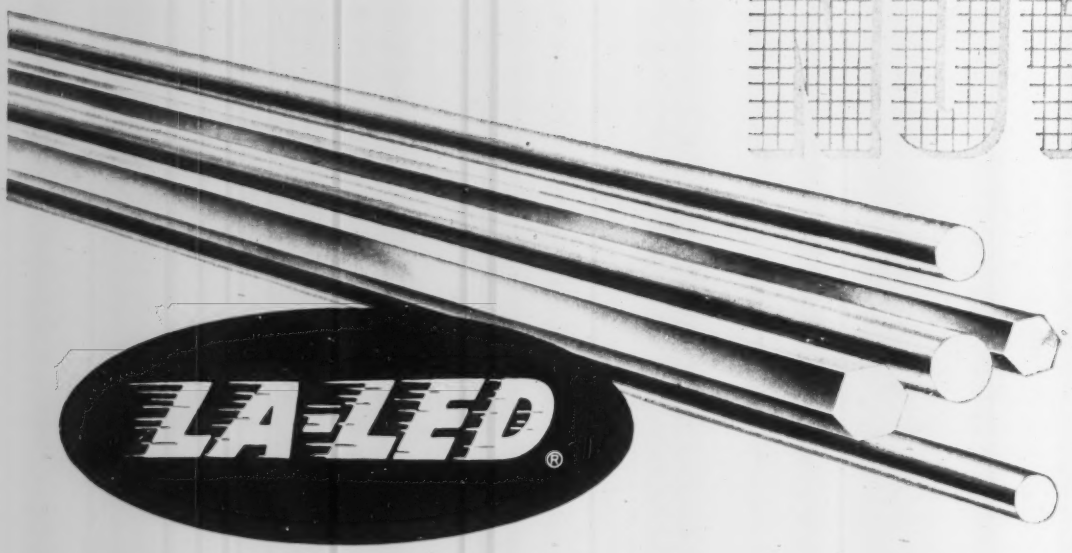
NILSON has been specializing in Forming Equipment for over 50 years.

THE A. H. NILSON MACHINE COMPANY
1512 Railroad Avenue • Bridgeport 5, Connecticut
CHICAGO • CLEVELAND • DETROIT • LOS ANGELES • HAMILTON, ONT., CANADA

Automatic Chain-Making Machines • Automatic Staple Forming Machines • Wire and Stock Reels • Foot Presses • Wire Straightening Equipment • Slide Feeds for Presses

THESE 3 FREE-MACHINING ...COLD-FINISHED

LEADED NOW



MACHINES 45% FASTER THAN B1113

At last you can switch over to LA-LED lead-bearing, free-machining steel bars for additional applications. This faster machining LaSalle steel cuts your parts cost and also improves your product. And because it is an open-hearth steel, LaSalle LA-LED has the added qualities of ductility, fine finish, and satisfactory carburizing. It maintains close dimensional accuracy, and can be crimped, riveted, staked, and cold worked. Available in rounds $\frac{5}{16}$" through 3", and hexagons $\frac{5}{16}$" through 1½".

La Salle STEEL COMPANY

Manufacturers of the Most Complete Line of Cold-Finished Carbon and Alloy Steel Bars in America!

STEEL BARS AVAILABLE!

ACTUALLY REPLACES BRASS!

MACHINES 80% FASTER THAN ORDINARY SCREW STOCKS

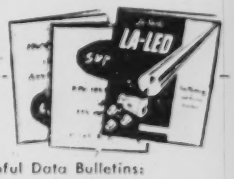
Here is the fastest machining steel ever commercially developed—Super LA-LED. Its exceptional machinability permits its use for those parts which previously could be machined economically only from brass. Since machine capacities so often limit the daily production of brass parts, you can now use Super LA-LED and obtain production approaching that of brass—and drastically cut the part cost.

New!
LEADED ALLOYS
.20 Carbon—.40 Carbon

ALL THE PROPERTIES OF ALLOY BARS PLUS GREATER MACHINABILITY!

Now you can get both Leaded 8620 and Leaded 4140 cold finished, steel bars. Being leaded, they machine one-third faster! Heat treating characteristics, hardenability, and mechanical properties are not appreciably affected by the addition of lead.

Send for these Bulletins



LA SALLE STEEL COMPANY
1414 150th Street
Hammond, Indiana

Please send me the following La Salle Helpful Data Bulletins:

☐ LA-LED #9 ☐ Super LA-LED #12 ☐ LEADED ALLOYS #14

Name _____

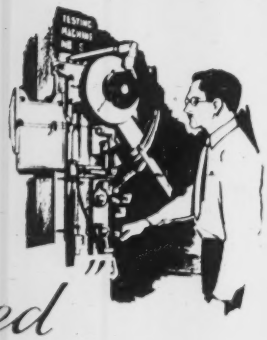
Title _____

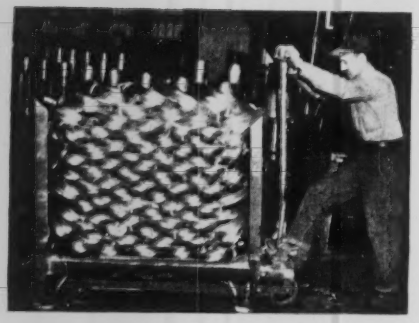
Company _____

Address _____

City _____ Zone State

"Laboratory Controlled"



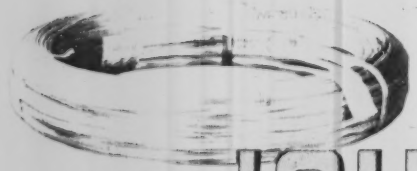


Specialty Wires by

JOHNSON

Johnson gives you absolute uniformity of prescribed physical and metallurgical properties. When you specify "Johnson" you get wire drawn on special equipment by men with special skills.

"Johnson Sets the Standard of the Industry"



JOHNSON

STEEL and WIRE COMPANY, INC.

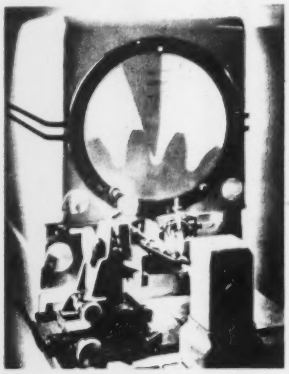
WORCESTER 1, MASSACHUSETTS

NEW YORK • PITTSBURGH • PHILADELPHIA • CLEVELAND • DETROIT • AKRON • CHICAGO
ATLANTA • HOUSTON • TULSA • LOS ANGELES • TORONTO

A SUBSIDIARY OF PITTSBURGH STEEL COMPANY

observation of a magnified gear image allows inspection, analysis and gaging of the gear under simulated operating conditions. Need for interpolative data is eliminated.

Analyzer checks a wide range of gear sizes without master gear. Complete analysis of running conditions can be made, even when



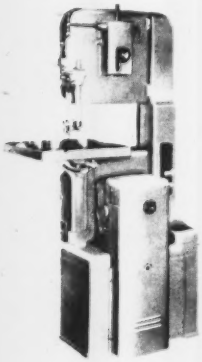
gear operates with backlash. Optical Gaging Products Inc., Dept. ST, 26 Forbes St., Rochester 11, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 8

Variable Speed Band Saw

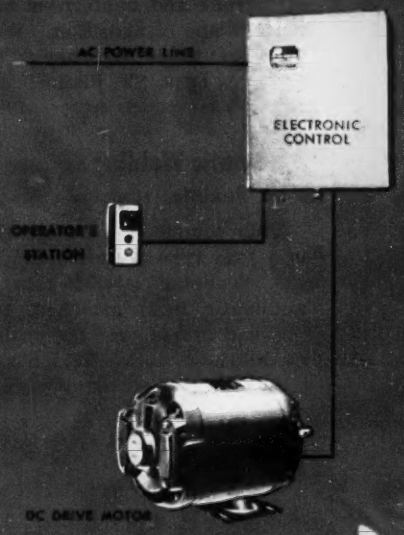
. . . range: 50 to 4500 sfm

This 16-inch band saw in the light-heavyweight class offers speed range from 50 to 4500 sfm. Speed change is effected through a handwheel operating a variable



diameter pulley, which is connected to the saw wheel through a gear train. Gear shift lever having two positions controls high or low speed range. Low range operates at 50 to 450 sfm; high range, at 500 to 4500 sfm. Changes can be made while machine is running.

Due to wide speed range, machine can be used on all types



TYPE EV SPEEDRANGERS are electronically-controlled, Thyraton type, adjustable-speed power drives with a wide range of operating speeds and good speed regulation.

SIZES. ⅛ to 1½ HP with basic speed of 2400 RPM.

SPEED RANGE. Drive speeds are adjustable down to one sixth of the basic speed for continuous duty, 50°C.; down to one twentieth of the basic speed, intermittent duty.

HOW IT WORKS. Single phase AC power is converted by Thyraton type electronic rectifiers to supply a DC variable-speed drive motor. This DC drive motor is of the separately excited type, which inherently has good speed regulation.

STANDARD CHARACTERISTICS are constant torque rating over the full speed range . . . complete control from a compact operator's station . . . infinite steps of speed adjustment . . . smooth starting and good speed regulation.

OPTIONAL FEATURES are jogging, reversing, dynamic braking, wide or special speed ranges and special duty cycles.

New

electronic variable speed drives

TYPE GV SPEEDRANGERS are electronically-controlled, motor-generator type, adjustable-speed power drives with a wide range of operating speeds and good speed regulation.

SIZES. 2 to 10 HP with basic speeds of 2400, 1750 and 1150 RPM.

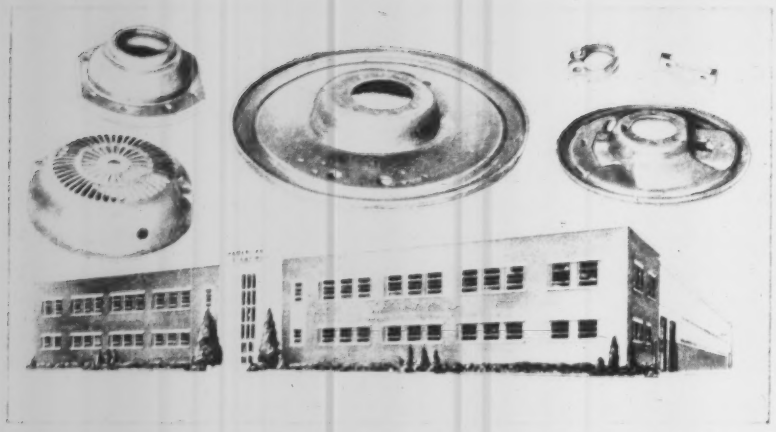
SPEED RANGE. Drive speeds are adjustable down to one sixth of the basic speed for continuous duty, 50°C.; down to one tenth of basic speed intermittent duty.

HOW IT WORKS. Three or two phase AC power is converted by a motor-generator set and by tube type electronic rectifiers to supply a DC variable-speed drive motor. This DC drive motor is of the separately excited type, which inherently has good speed regulation.

OPERATION. The Type GV Speedrangers have the same standard characteristics and optional features as listed above for the Type EV Speedrangers.

MANY TYPES. The DC drive motor for both the Type EV and GV Speedrangers are available with Master Unibrakes, Fluid Drives and any of the five types of Master Gearmotors.

THE MASTER ELECTRIC COMPANY
DAYTON, OHIO



STAMPINGS—any shape, up to 30" diameter, of metals from .025" to .375" in thickness. Presses of 20 tons to 1000 tons pressure. Projection and spot welding. Complete die and tool shop, and engineering service. Over 30 years experience.

The AMERICAN STAMPING Co.

26680 Lakeland Blvd. • Cleveland 23, Ohio

"TIMBER-R-R"
WISCONSIN-POWERED
Generator *Supplies Current*

Quick falls for the big ones, such as this 6½ ft. Douglas fir, are easy when this Electric Chain-Saw goes to work. Furnishing the 180 cycle, 3 phase, 220 volt current is an electric generator, powered by a Model VF-4, V-type, 4-cylinder Wisconsin Heavy-Duty Air-Cooled Engine.

In the timber country and in many other fields, Wisconsin Engines are *preferred* power for these reasons:

Tapered roller bearings at both ends of the crankshaft eliminate all thrusts • Foolproof AIR-COOLING, summer and winter • An easily-serviced, high-tension outside magneto with impulse coupling for quickest all-weather starts • Rugged construction for heavy-duty service.

Today, write for the new 64-page application and specification booklet, covering all 4-cycle single-cylinder, 2-cylinder and V-type 4-cylinder models, 3 to 36 hp.

Power TO FIT THE MACHINE

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

A-7656-1a

NEW PRODUCTS and equipment

of ferrous and nonferrous metals, plastics and composition. Walker-Turner Division, Kearney & Trecker Corp., Dept. ST, Plainfield, N. J.

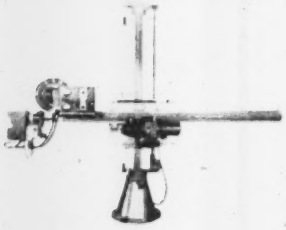
FOR MORE DATA—CIRCLE REPLY CARD NO. 9

Automatic Welding Fixture

. . . flexible, ram-type machine

This completely flexible fixture is a ram type machine, the model CB. Tubular lateral ram, with automatic head attached, travels 6 feet 6 inches over the positioned or rotating work. Variable speed drive provides welding speed range of 0 to 100 ipm.

Motorized vertical adjustment



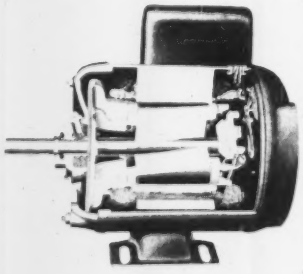
ranges from 13 inches to 6 feet. Tubular column containing counterweight and ram rotates 360 degrees. Model can be mounted on a carriage to travel longitudinally on a special track. C. B. Herrick Mfg. Corp., Dept. ST, 1935 Euclid Ave., Cleveland 15, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 10

Rerated Motor Line

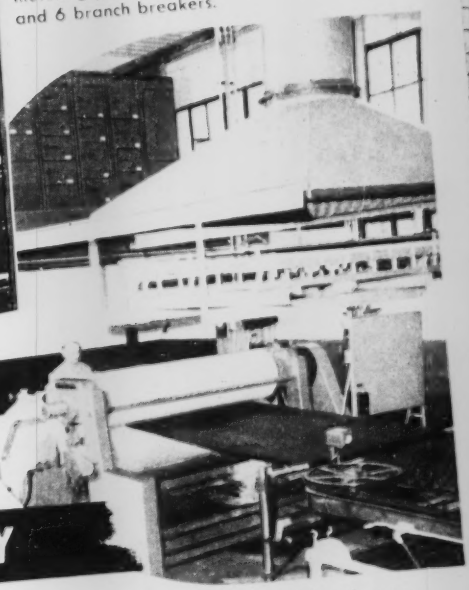
. . . fractional horsepower line

Fractional horsepower motors, in rerated design, employ techniques that permit more horsepower in smaller frames, with same performance standards. Motors are available as type SP split phase single phase induction for general purpose applications, where



SQUARE D "PLUG-IN" Control Centers

at left • Control center with main breaker, metering panel, 33 combination starters and 6 branch breakers.



at right • beginning of a processing line in the Fairlawn Finishing Company, Fairlawn, New Jersey. Square D control center, compact and out of the way, provides control of all automatic operations in applying water-repellent finish on nylon.

for ECONOMY · SAFETY · FLEXIBILITY

ECONOMY in installation because factory assembly has done most of the work of mounting and wiring individual motor starters. For easy wiring, large vertical and horizontal gutters are front accessible without removing units. Economy of space because standard 20"W x 20"D x 90"H sections accommodate up to six combination motor starters.

SAFETY because bus structure is rigidly supported on porcelain insulators and is designed to withstand short circuits up to 25,000 amperes. Safety because dead front handle mechanism always indicates true position of circuit breaker or switch and can be locked off with one to four padlocks.

FLEXIBILITY because plug-in units may be removed, added or exchanged at will. Both fusible switch and circuit breaker types are available. Flexible because standardized sections and units are always re-usable after plant conversion.

Your nearby Square D Field Engineer will give you the complete story . . . or write for BULLETIN 8938. Address **Square D Company, 4041 North Richards Street, Milwaukee 12, Wisconsin.**

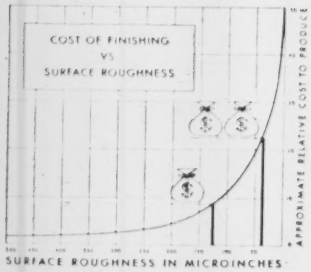
ASK YOUR ELECTRICAL DISTRIBUTOR FOR SQUARE D PRODUCTS

SQUARE D COMPANY

1903 · **50** YEARS OF DESIGN LEADERSHIP · 1953

Surface finish control can reduce *your* machining costs

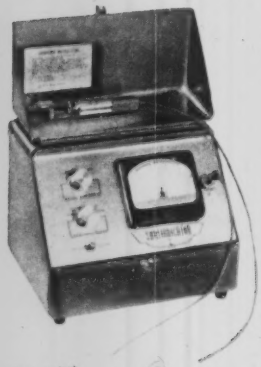
PROPER surface finish control may well yield big savings in your plant by reducing production costs, increasing production rates, and improving product performance.



The chart shows how finishing affects the cost of machined parts. For example, if the surface finish is specified as 125 microinches and you are overfinishing to 32 microinches because of lack of proper gaging equipment, your finishing cost can be twice as much as necessary. To eliminate costly overfinishing, actual checks of machined surfaces should be made in the shop to be sure that specified values are met *but not exceeded.*

With surface finish control you can eliminate unnecessary operations and operate more efficiently. It helps you improve your products, since surface finish affects many factors in performance, such as break-in time, wear, heat transfer, lubrication, etc.

A new method of Surface Finish Control



THERE is now a simple method of measuring surface roughness on the production line so that the benefits of surface finish control can be realized. The Brush SURFINDICATOR* is a portable inspection tool . . . easy-to-use . . . accurate. This new instrument makes surface roughness measurement a practical shop operation.

*Trade Mark

Get the complete story—get your copy of this new booklet on Surface Finish Control. It offers you the key to reduced machining costs, more efficient use of equipment, and improved products. Write Brush Electronics Company, Dept. PP-12, 3405 Perkins Avenue, Cleveland 14, Ohio.

BRUSH ELECTRONICS COMPANY

INDUSTRIAL ANALYSIS INSTRUMENTS
PIEZOELECTRIC MATERIALS • ACOUSTIC DEVICES
MAGNETIC RECORDING EQUIPMENT
ULTRASONIC EQUIPMENT

BRUSH ELECTRONICS

formerly
The Brush Development Co.
Brush Electronics Company
is an operating unit of
Clevite Corporation.

NEW PRODUCTS and equipment

load is easy to start and easy to pull up to speed.

Type CS capacitor-start single-phase induction is designed for hard-to-start applications, such as pumps, compressors, machines starting loaded, etc. Type SC is squirrel cage polyphase (in 3 or 2-phase) induction for all general-purpose applications. Century Electric Co., Dept. ST, St. Louis 3, Mo.

FOR MORE DATA—CIRCLE REPLY CARD NO. 11

Hydraulic Loading Ramp

. . . ready truck connection

This loading ramp consists essentially of a 7 or 8-foot-long hinged section of the dock that can be raised 12 inches above or lowered 12 inches below dock level. Result is ready connection for loading purposes with truck floors of almost any height.

Hydraulically - operated piston

under the moving end of the ramp has lifting capacity of 5 or 10 tons, in the two available sizes. Ramp can be controlled by simple movement of hand lever located at dock's edge or at some remote point. Cemco Industries Inc., Dept. ST, Galion, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 12

Electric-Powered Die Puller

. . . one man performs cycle

One man performs the entire die pulling cycle under safe conditions with this electric-powered die pulling and pushing device. Unit is built directly onto the platform of high lift electric truck and equipment includes pushbutton control. Effect of this is to simplify the entire job for the operator.

One operator can handle dies of many capacities by using the

TOOL SHOP SHORT CUT—

A DELTA Drill Press on Every Work Bench Saves Time and Money for BINGHAMTON DIE & MACHINE CO.

"It's much cheaper to install an individual 14" Delta drill press on every diemaker's bench than to move men and machines," says Frank Bowie, owner of this thriving Binghamton, N.Y., shop.

No waiting, no running back and forth—a Delta drill press on every work bench increases Binghamton Die & Machine Co. profits.

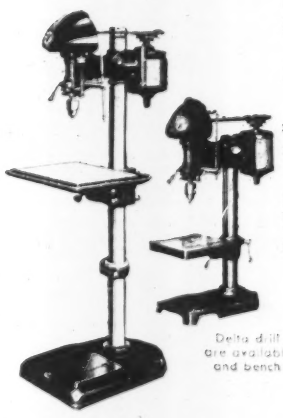
Making dies for big shoe factories is his main business, and on most jobs more than half the operations are done on a Delta drill press.

"Accuracy is absolutely essential," says Mr. Bowie, "and we've had remarkable service from our Delta drill presses—for 16 to 18 years, in some cases. At times we use them as arbor presses, and still they stay accurate. They're not babied, either—used night and day in rush periods. Maintenance cost is negligible—no more than $20 per year on all our Delta equipment."

In addition to 18 Delta 14" drill presses, the company has a 17" drill press, three Delta grinders, a 14" bandsaw and a disc grinder.

You, too, can save money with low-cost, high accuracy Delta tools. It costs you so little to have Delta tools throughout your shop—they're ready to use without waiting, eliminate set-up for special jobs, and are easy to relocate at any time.

Do you have up-to-date Delta literature? Send for Catalog AB-52; and call the Delta dealer listed in the Classified Telephone Directory under "Tools." Write Delta Power Tool Division, Rockwell Manufacturing Company 638M N. Lexington Ave., Pittsburgh 8, Pa.



Delta drill presses are available in floor and bench models.

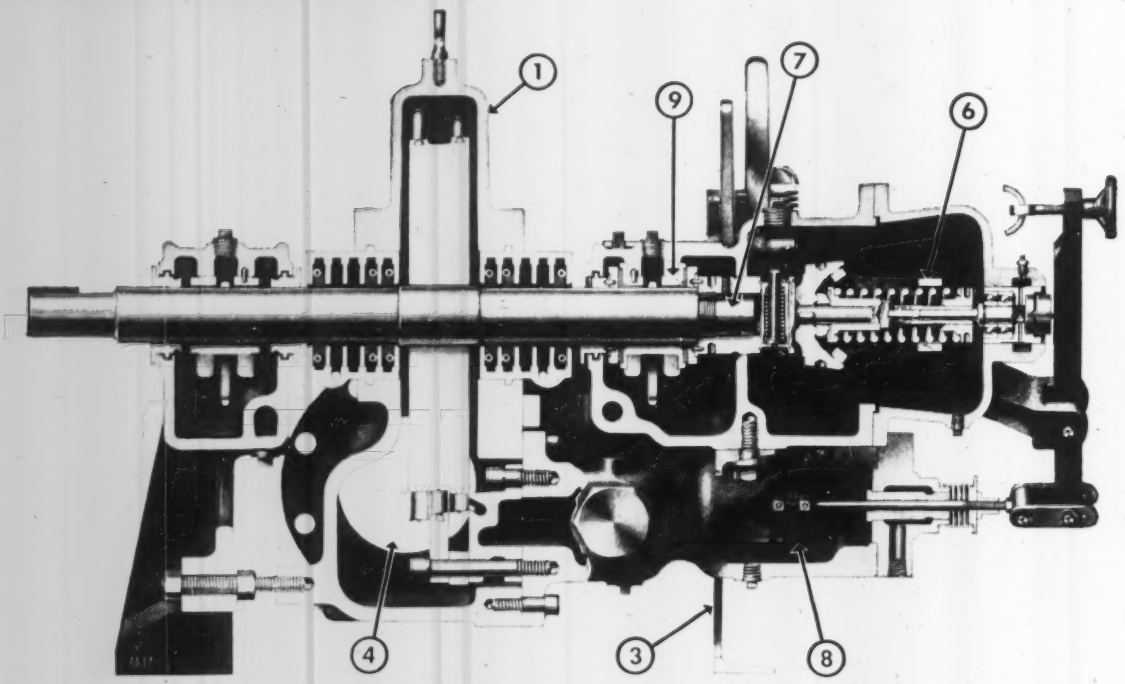
ROCKWELL

DELTA QUALITY POWER TOOLS

Another Product of **Rockwell**

NEW DE LAVAL HCB SINGLE STAGE TURBINE

can be ordered from stock



1 Case and Cover Split Horizontally on centerline for ease of maintenance.

2 True Centerline Casing Support assures distortion-free radial expansion. *Not shown.*

3 Flexible Support at governor end provides for axial expansion.

4 Exhaust Opening either right or left side for installation flexibility.

5 Steam Strainer, protecting trip and governor valves, is *removable* for cleaning without breaking steam connections. *Not shown.*

6 Constant Speed Governor features governor weights pivoted around frictionless surfaces.

7 Complete Governor Assembly is now *replaceable as a unit.*

8 Balanced Single Seated Main Governor Valve has proportional flow characteristics for sensitive, positive control.

9 Shaft Locating Bearing of adjustable double collar type.

Horsepower: 100 MAX
Steam Pressure: 300 PSIG MAX
Steam Temperature: 550F MAX
Exhaust Pressure: 25 PSIG MAX
Speed: 4,000 RPM MAX
Steam Inlet: 2"–250# ASA FLG.
Exhaust: 6"–150# ASA FLG.
Weight: 1,200 LB

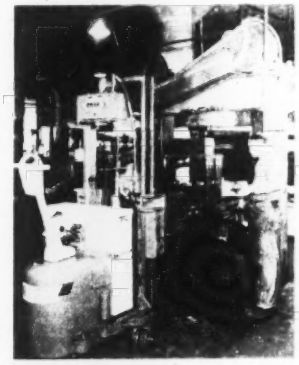
Here's the new De Laval HCB Single Stage Turbine which is now "on the shelf" . . . ready for immediate shipment. This mechanical drive turbine is simple, rugged, designed for long economical life and low maintenance. For example, note the true centerline casing support, the replaceable governor, the removable steam strainer. Investigate all the advantages of this versatile driver. It is ready to handle—*at low cost*—a variety of applications in your plant.

Send for new Bulletin 4206
which gives vital facts and figures

DE LAVAL *Mechanical Drive Turbines*

DE LAVAL STEAM TURBINE COMPANY
860 Nottingham Way, Trenton 2, New Jersey

truck, which lifts, lowers and travels electrically. Dies are pulled from the rack or press by means of a chain which is run through die pullers on the truck platform and around the upright. For placing the die in rack or press, chain is removed and bar pusher attachment placed on the platform be-



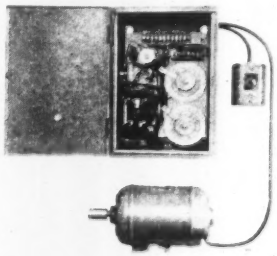
tween die pusher and the die itself. Barrett-Cravens Co., Dept. ST, 4609 S. Western Blvd., Chicago 9, Ill.

FOR MORE DATA—CIRCLE REPLY CARD NO. 13

Adjustable Speed Drives

. . . converts ac to dc power

Vari-amp magnetic amplifier motor drive is a compact, self-contained unit that provides adjustable motor speeds from an alternating current power source. It converts power from a 115-v 60-cycle ac source to direct current. Speed is continuously adjustable over the complete range by means

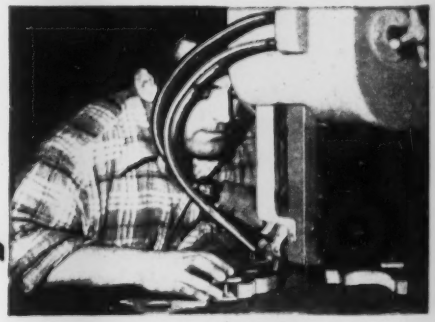


of small rheostat located on the control station.

Standard unit provides 10 to 1 speed range and is available with motors ranging from 1/40-hp up to ½-hp. Unit consists of three components: Main control panel, control station and motor. Basic

YOU *Can* AVOID DIE COSTS COMPLETELY

On Your Next STAMPING ORDER



Yes, you can – but it's not *necessarily* the best thing for you.

You want the lowest unit cost – *for the life of the part*, including re-runs. It may well be that our **Machine-Cut Method**, with no die cost, does work out best.

Or, it might better be our **Short Run Method**, using economical blanking dies and stock punches.

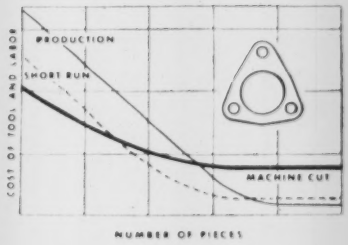
Sometimes, even with very short runs, it pays to use our **Production Method** with a standard die or our own surprisingly inexpensive Hecht-type tool.

In *any* case, the decision is a technical one based on many factors, not just length of run. You save money when the correct decision is made.

WE USE ALL THREE METHODS — LET US MAKE AN IMPARTIAL DECISION FOR YOU

For example, take the part illustrated. From 1-65 parts, our Machine-Cut Method is most economical. At 65 parts, the Short-Run Method is best until, at 7,000 units, the standard Production Method is most satisfactory.

These breaking points as charted vary drastically with every stamping, but the general principle remains the same.



LAMINATED SHIM COMPANY, INC.

Manufacturers of ALL TYPES OF SHIMS

STAMPINGS DIVISION

ONE PIECE OR ONE MILLION

STAMPINGS DIVISION, LAMINATED SHIM COMPANY
3412 Union Street, Glenbrook, Conn.

Gentlemen:

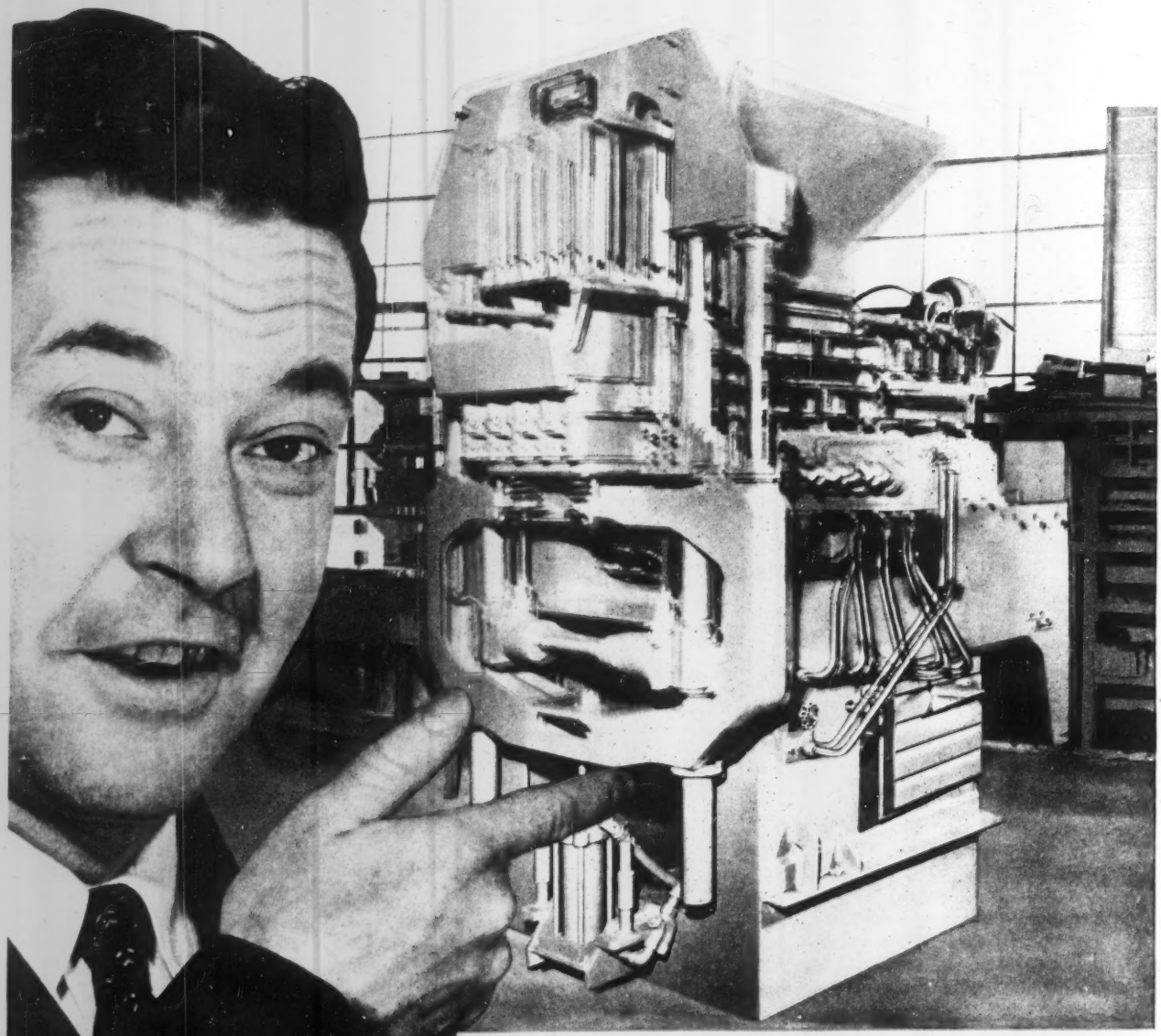
Please rush me my free copy of "SERVICE IN STAMPINGS"—the 12-page, illustrated booklet full of helpful facts on the economical buying of stampings.

NAME _____ TITLE _____

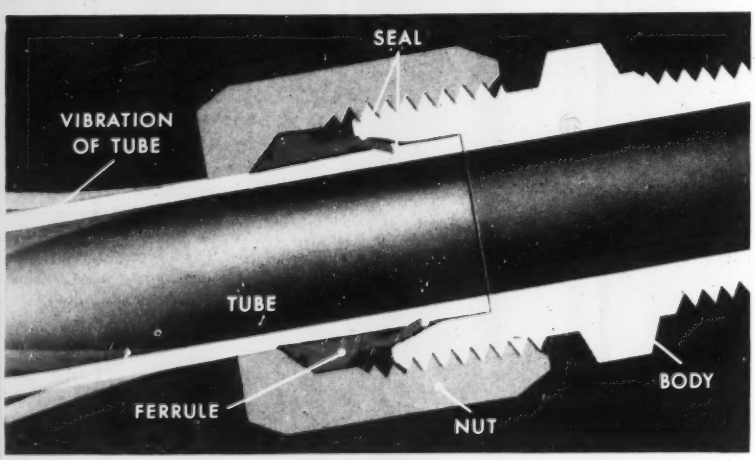
COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____



Shaking furiously, this machine, built by Columbia Machine Works of Vancouver, Washington, molds 8 building blocks per minute. It compresses concrete, vibrates it under 350 psi, and ejects finished blocks.



Cutaway shows how vibration is damped by the rear bevel of the ferrule. Note how it grips the tube. This prevents stresses at the double seal and assures a leakproof connection. The nut also helps support the tube.

GOT THE SHAKES?

Solve your tube vibration problems with leakproof Parker *Ferulok* flareless fittings

This machine shakes from stem to stern. Because of the extreme vibration, maintenance of hydraulic lines was a big problem until the design was changed to specify Parker *Ferulok* flareless fittings. Since then the manufacturer has not had a single call for hydraulic line maintenance nor received any customer complaints.

Here's what makes *Ferulok* flareless fittings leakproof on such critical applications:

These flareless steel fittings have a double seal. Wedging action of the ferrule, when drawn down by the nut, forms a seal between body and ferrule. The cutting edge of the ferrule "bites" into the outer surface of the tube, forming a second positive seal. Self-centering action assures an even "bite" around the circumference of the tube. The extent of the bite at the cutting edge of the ferrule is completely visible when the fitting is taken apart.

Vibration won't break these seals. The rear bevel of the ferrule grips the tube. This damps vibration and prevents stresses from concentrating at the line of "bite".

Parker *Ferulok* flareless fittings are designed especially for high-pressure, heavy-wall tubing. *Ferulok are the fittings that conform with the new S.A.E. Hydraulic Flareless Tube Fittings Standard.* Of course, they also meet J.I.C. Hydraulic Standards for flareless fittings.

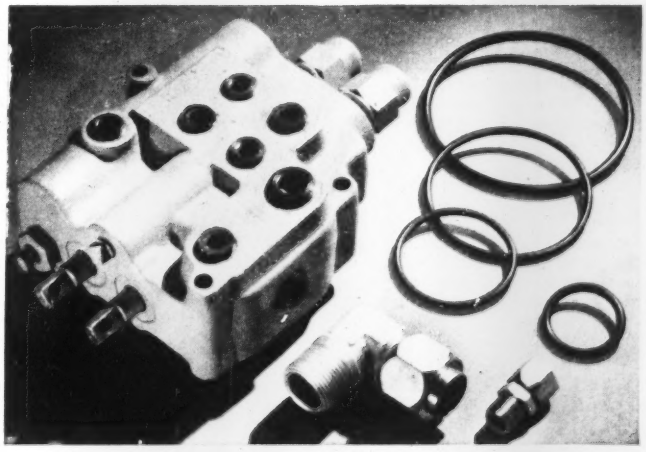
You have no assembly problems when you specify Parker *Ferulok*. Simply use a wrench; no special tools are needed.

Why not specify Parker *Ferulok* flareless fittings for *your* heavy-wall tubing applications? We now offer a greatly expanded *Ferulok* line with a complete range of body shapes and sizes for tubing through 2 inches, outside diameter.

TUBE AND HOSE FITTINGS DIVISION
The Parker Appliance Company
17325 Euclid Avenue, Cleveland 12, Ohio

Parker

Hydraulic and fluid system components



What other Parker products for hydraulic and fluid systems interest you? Triple-lok flare fittings? Hydraulic control valves? Synthetic rubber O-rings? Any other Parker products?

THE PARKER APPLIANCE COMPANY
Section 401 N
17325 Euclid Avenue
Cleveland 12, Ohio

☐ Please rush Parker fittings catalog No. 4300

☐ Information about the following products

NAME TITLE

COMPANY

ADDRESS

CITY STATE

Send for catalog of complete information about Parker tube fittings. If you'd like to know about Parker products, please list them on the coupon or write to the above address

How Much

Excess Weight

in Your Product?

Trim it down to "fighting weight" with stampings by GEOMETRIC

The cost of your product is largely determined on the drawing board. Whenever you use castings or forgings as component parts, where stampings would do as well, you increase the weight and cost of your product unnecessarily.

Many progressive manufacturers have cut the cost of component parts up to 75% by converting from castings to stampings. Savings of 50% are common.

Geometric Engineers, trained in the analysis of all kinds of stamping problems, are glad to show you how your product, or parts of it, can be made better, lighter and at much lower cost in our modern high-production stamping plant.

Write today for free booklet — "Geometric Craftsmanship"

GEOMETRIC STAMPING CO.

A Subsidiary of Barium Steel Corp.

1130 E. 200th Street Cleveland 17, Ohio

NEW PRODUCTS and equipment

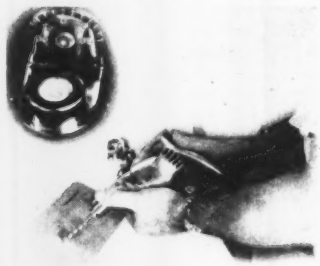
unit is provided with an on-off switch and speed adjusting rheostat on the control station. Optional features include jogging, dynamic braking and reversing. Clark Controller Co., Dept. ST, 1146 E. 152nd St., Cleveland 10, O.

FOR MORE DATA—CIRCLE REPLY CARD NO. 14

Hole Drilling Level

. . . accuracy at any angle

Simple, practical level designed for drilling holes accurately at any angle can be attached to the housing of any portable drill in less than a minute. Called Dril-Level, the unit consists of a circular bub-



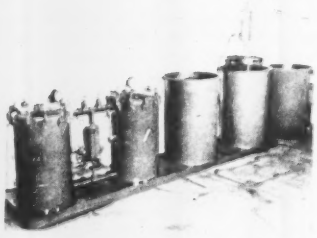
ble level mounted on a graduated bracket, calibrated from 0 to 90 degrees. M & J Specialty Co., Dept. ST, Red Hook, Dutchess County, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 15

Packaged Impregnation System

. . . positive pore penetration

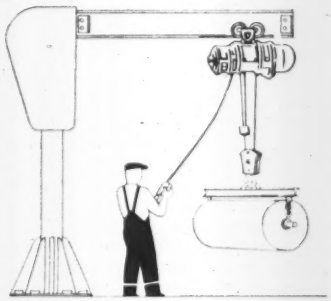
Compact packaged system for impregnation of porous metals is based on polyester resins and vacuum pressure cycle. Model 1-24-L occupies a floor area of about 3 x 11 feet; for larger production requirements, model 1-36-L covers floor space of 4 x 16 feet.



Both units, mounted on steel platform and skids, are installed with a complete line of necessary equip-

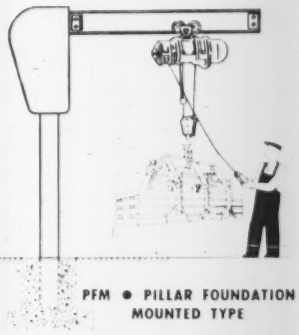
Industrial JIB CRANES

Industrial Jib Cranes are designed and built to the same high standard set for Industrial Overhead Traveling Cranes. The smooth performance and unfailing service of these quality Jib Cranes has made them favorites throughout industry. Consult Industrial Crane & Hoist Corporation for better equipment to solve your materials handling problems.



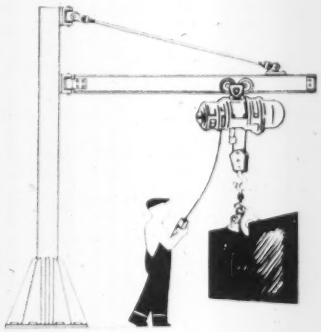
PBM • PILLAR BASE MOUNTED TYPE

The Industrial PBM and the PFM heavy duty, self supporting Jib Cranes are designed for 360° rotation, are of welded steel construction, and equipped with ball and roller bearings. Capacities up to 12,000 #.



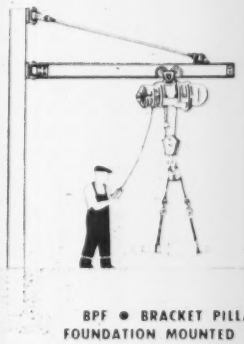
PFM • PILLAR FOUNDATION MOUNTED TYPE

The Industrial PBM and the PFM Heavy Duty Jib Cranes are the same except for the construction of the base. Self-supporting and designed to revolve in a complete circle these Jibs can be economically used in a myriad of applications. The 4 roller, 9 bearing head is designed for heavy duty applications and both models are available in capacities up to 12,000 #.

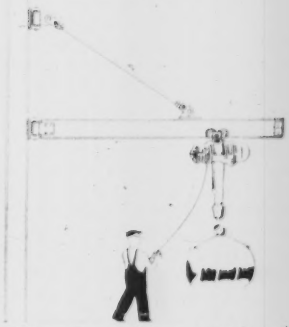


BPB • BRACKET PILLAR BASE MOUNTED TYPE

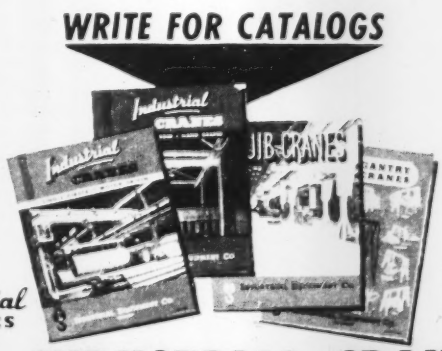
The Industrial BPB and the BPF self supporting Jib Cranes are designed for 180° rotation. Equipped with annealed cast steel hinge fittings, heavy duty bronze bearings and double tie rods. Capacity up to 6000 #.



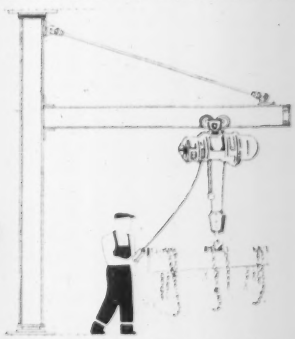
BPF • BRACKET PILLAR FOUNDATION MOUNTED TYPE



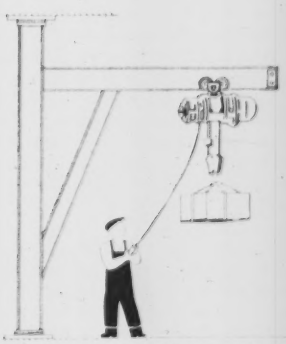
WBT • Industrial Wall Bracket Type Jib Crane for mounting on a steel column or factory wall. Available in capacities up to 6000 #.



WRITE FOR CATALOGS



MTD • Industrial Mast Type Jib Cranes designed to rotate 360°. Equipped with heavy duty top and bottom bearings. Capacities up to 12,000 #.



MTC • Industrial Mast Type Compression Brace Jib Crane, designed to rotate 360°, equipped with heavy duty top and bottom bearings. This Jib is designed for high lift in capacities up to 12,000 #.

Industrial CRANES

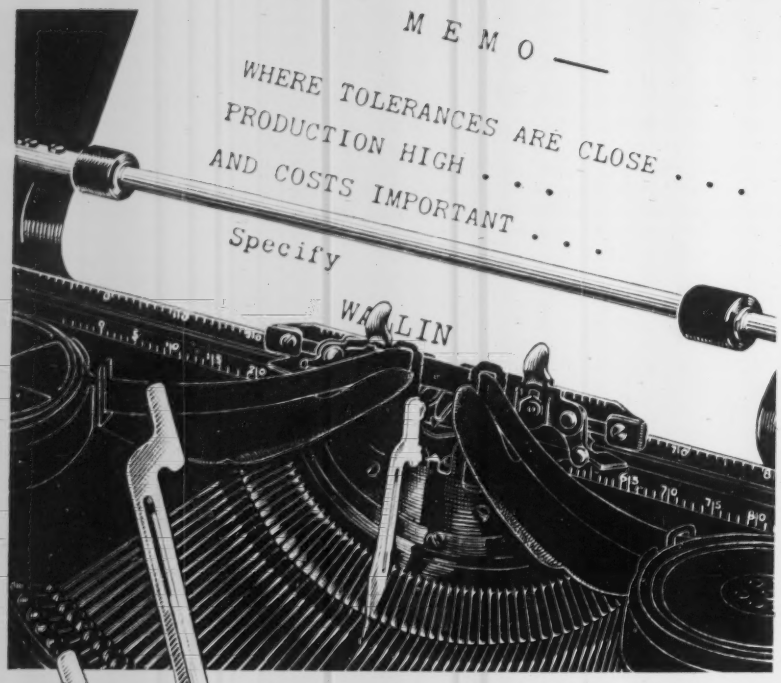
INDUSTRIAL CRANE & HOIST CORPORATION

(formerly Industrial Equipment Co.)

303 NORTH ADA STREET — CHICAGO 7, ILLINOIS

Overhead Cranes • Jib Cranes • Monorail Systems • Crane Runways

Representatives in Principal Cities



WALLINGFORD

CLOSE-TOLERANCE

STEEL STRIP

When it comes to precision parts like type bars, leading typewriter manufacturers specify Wallingford Steel Strip. They've found that the smooth surfaces and closely held thickness tolerances mean reduced fabricating and finishing costs and insure accurate spacing with smoother, quieter typing action.

The uniform high quality of Wallingford Steel Strip and Tubing doesn't just happen; it's the result of experience, know-how and a determination to produce the best . . . combined with the finest, most up-to-date equipment available. Our new Sendzimir mill, for example, can roll steel strip down to .002" thick and . . . equipped with the most advanced continuous gages . . . will maintain accuracies to ±.0001".

A growing list of satisfied customers look to Wallingford Steel for those important extra values in product quality and service. You too will find that Wallingford can meet your most exacting specifications for size, finish, analysis and temper . . . and can deliver *what* you want *when* you want it.

Call us today. We will welcome the opportunity to cope with the tough problem.

THE **WALLINGFORD** SINCE 1922 **STEEL** CO.

WALLINGFORD, CONN., U.S.A.

LOW CARBON • HIGH CARBON • ALLOY • STAINLESS • STRIP and TUBING

NEW PRODUCTS and equipment

ment. Both can be purchased with two impregnating tanks, if necessary.

In the manufacturer's batch immersion process, castings are placed in a sealed chamber and evacuated to remove all air from the pores. Without breaking the vacuum, impregnant is introduced into the chamber under pressure, applied for a minimum of 30 minutes, then surfaces are washed and cured. American Metaseal Mfg. Corp., Dept. ST, W. New York, N. J.

FOR MORE DATA—CIRCLE REPLY CARD NO. 16

Permanent Cement

. . . with fingertip pressure

Industrial adhesive so sensitive it takes only fingertip pressure to join materials is at the same time sufficiently strong to fasten permanently rubber, metals, plastics or fibers together in any combination.

The liquid adhesive withstands a force up to 10,000 pounds in holding together any two metals properly joined.

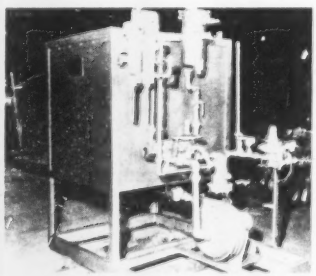
It resists completely attacks by salts, alkalis, acids, moisture or solvents. Cycleweld Products Division, Chrysler Corp., Dept. ST, Detroit 31, Mich.

FOR MORE DATA—CIRCLE REPLY CARD NO. 17

Atmosphere Generator

. . . 250 to 3000 cu ft per hour

This endothermic type protective atmosphere generator has size range from 250 to 3000 cu ft per hour output for protecting metals during heat treatment. It has



rectangular alloy retort in smaller sizes, centrifugally cast alloy retorts in larger units.

Generator is heated electrically by radiant type tube elements that can be changed without inter-

EXTRA AUXILIARY CONTACTS

for ALL Allen-Bradley Starters . . . Sizes 0 to 7

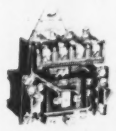
Auxiliary Contacts—Sizes 0 & 1

NOW . . . it's easy to add auxiliary contacts to A-B solenoid starters to operate extra relays, pilot lights, or other accessories. Just follow the steps shown below.

Bulletin 895 auxiliary contacts come in forms to fit all sizes of starters . . . with either single pole normally open, normally closed, or normally open-normally closed contacts. They can be added to any A-B starter in stock or in service.

Auxiliary Contacts—Sizes 2 & 3

ADD ONE OR TWO AUXILIARY CONTACTS TO ANY A-B SOLENOID STARTER



Bulletin 709 Size 0 starter with auxiliary lock-in contact

Size 0 Auxiliary Contact

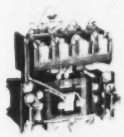
Bulletin 709 Size 0 starter with one extra auxiliary contact

Second Size 0 Auxiliary Contact

Bulletin 709 Size 0 starter with two extra auxiliary contacts

SIZE 0 STARTER

One or two extra auxiliary contacts can be mounted on Size 0 arc hood. Terminals are easily accessible from front. Rugged—simple—trouble free.



Bulletin 709 Size 1 starter with auxiliary lock-in contact

Size 1 Auxiliary Contact

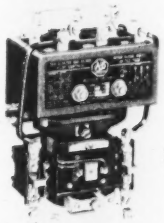
Bulletin 709 Size 1 starter with one extra auxiliary contact

Second Size 1 Auxiliary Contact

Bulletin 709 Size 1 starter with two extra auxiliary contacts

SIZE 1 STARTER

One or two extra auxiliary contacts can be mounted on Size 1 arc hood. Terminals are accessible from front. Existing wiring not disturbed in any way.



Bulletin 709 Size 2 starter with auxiliary lock-in contact

Size 2-3 Auxiliary Contact

Bulletin 709 Size 2 starter with one extra auxiliary contact

Second Size 2-3 Auxiliary Contact

Bulletin 709 Size 2 starter with two extra auxiliary contacts

SIZE 2 STARTER

Mounting plate will hold one or two extra Size 2-3 auxiliary contacts. It is attached to starter using existing arc hood threaded studs and lock nuts. Solenoid plunger of starter actuates the auxiliary contacts.

Bulletin 709 Size 3 starter with auxiliary lock-in contact

Size 2-3 Auxiliary Contact

Bulletin 709 Size 3 starter with one extra auxiliary contact

Second Size 2-3 Auxiliary Contact

Bulletin 709 Size 3 starter with two extra auxiliary contacts

SIZE 3 STARTER

The Size 2-3 mounting plate will also fit the Size 3 arc hood and support one or two auxiliary contacts. Easy to install and simple to operate. Trouble free performance is guaranteed. No contact maintenance.

Contact arrangements are readily changed from normally open to normally closed, or vice versa. This flexibility opens new possibilities for applying Allen-Bradley contactors and starters to automatically controlled equipment.

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.

A-B Quality

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

8-53-MR

MAKE YOUR OWN TERMINAL STRIPS

with these handy

BULLETIN 892 TERMINAL BLOCKS

EASILY MADE UP IN ANY LENGTH TO MEET YOUR TERMINAL STRIP SPECIFICATIONS

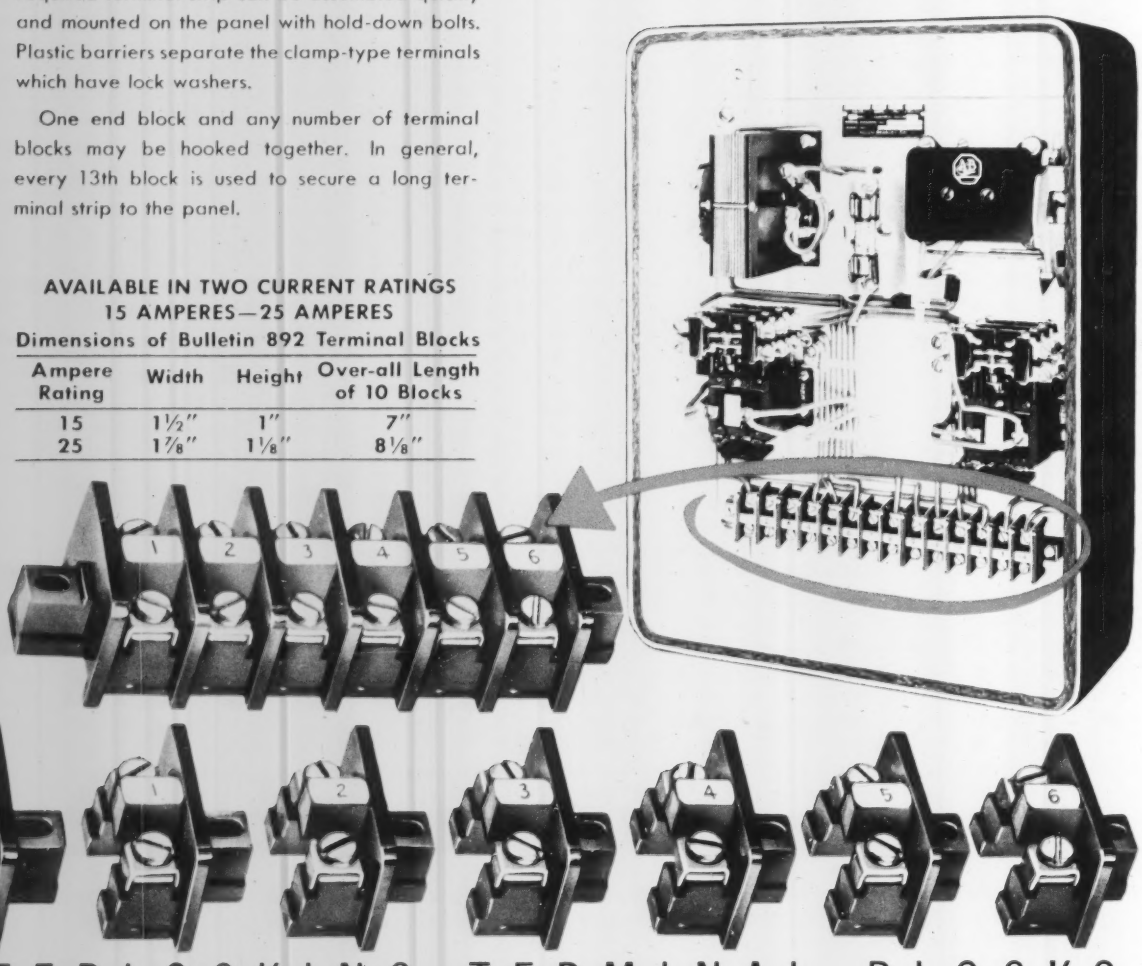
Bulletin 892 terminal blocks interlock in perfect alignment to provide the exact number of terminals for any panel board. There are no excess terminals—hence, no waste of panel space. The required terminal strip can be assembled quickly and mounted on the panel with hold-down bolts. Plastic barriers separate the clamp-type terminals which have lock washers.

One end block and any number of terminal blocks may be hooked together. In general, every 13th block is used to secure a long terminal strip to the panel.

AVAILABLE IN TWO CURRENT RATINGS
15 AMPERES—25 AMPERES

Dimensions of Bulletin 892 Terminal Blocks

Ampere Rating	Width	Height	Over-all Length of 10 Blocks
15	1½"	1"	7"
25	1⅞"	1⅛"	8⅛"



INTERLOCKING TERMINAL BLOCKS

ALLEN-BRADLEY
QUALITY
MOTOR CONTROL

A-B Quality

Allen-Bradley Co.
1316 S. Second St., Milwaukee 4, Wis.

8-53-MR

rupting operation. Provisions are made for admission of enriching cases for extra brightness of special work. Units are complete with flow meters and regulators, safety equipment and automatic temperature controls. Automatic atmosphere control apparatus is available as optional equipment. Ferguson Equipment Corp., Dept. ST, 21st. & Penn Ave., Pittsburgh 21, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 18

Steel Box Safety Glove

. . . box tips save fingers

This safety glove uses the steel box principle as employed in safety shoes to provide protection from smashed fingers. A lightweight glove is designed so safety tips do not interfere with complete hand freedom of the workman.

Tempered carbon steel cap is cemented into tips of three fingers

on each hand. Compression tests show that each tip resists a pressure of 2 tons. Wolverine Shoe & Tanning Corp., Dept. ST, Rockford, Mich.

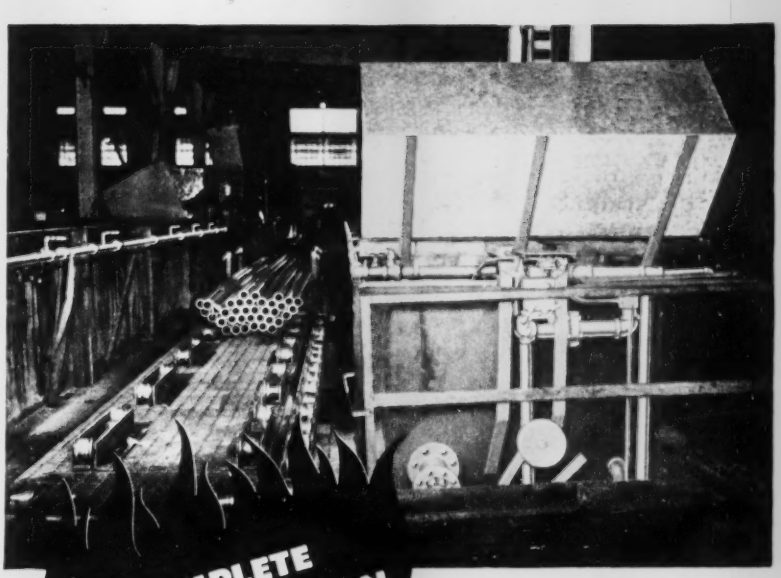
FOR MORE DATA—CIRCLE REPLY CARD NO. 19

Portable Maintenance Station

. . . brazing, soldering, heating

Air-acetylene apparatus permits quick maintenance and repair work on all types of jobs where fusion welding is not essential. Complete outfit consists of torch, tips, hose and adjustable regulator. Weighing about 32 pounds, it is portable within the shop or to outside jobs.

Torch can be used for brazing with silver or copper alloys, soldering and heating. It is particularly suitable for work on sheet metal, steel piping, copper tubing,



COMPLETE FIRE PROTECTION FOR EVERY PLANT INCLUDING YOURS!

Illustrated here is a dip tank cleaning operation, a Hot Spot fire hazard area common to many types of metal working operations. But, although fire may start at this particular location — it cannot make headway, for ENGINEERED "Automatic" FIRE PROTECTION is "on the job" at all times.

At the first hint of flame, heat sensitive fire detectors operate controls that dump flammable liquids, stop conveyor systems and discharge fire-smothering "Automatic" FIRE-FOG and AIR FOAM throughout the danger area.

ENGINEERED "Automatic" FIRE PROTECTION starts with an analysis of your needs for complete sprinkler coverage. It includes study of manufacturing and processing operations, as well as machinery and equipment which may, in addition, demand special protection such as FIRE-FOG, AIR FOAM, CO_2 or a combination of these extinguishing mediums. The need is dictated by the degree of hazard, demand for personnel safety, high value of equipment, critical nature of certain processes or operations to entire plant production, continuity of business operations.

Want to learn how ENGINEERED "Automatic" FIRE PROTECTION can safeguard your plant — save you dollars while doing it? FREE descriptive literature is yours for the asking. Write for Bulletin 66.

Investigations and post mortems that look into the "causes" of a serious fire bring back nothing . . . are but mildly beneficial to anyone. The fire, discovered at its start, and extinguished in its infancy, cannot result disastrously.

"Automatic" Sprinkler
CORPORATION OF AMERICA
YOUNGSTOWN, OHIO
Offices in principal cities of North and South America

New Pickling Inhibitor Preserves Surface During and *AFTER* Scale Removal

Houghton "Acitrol 3129" effective across-the-board . . . assures minimum breakdown over long periods at high temperatures!

SAVES STEEL AND ACIDS

This new liquid inhibitor does the vital job of protecting the metal against acid attack after the scale is removed as well as during the operation. Acid is conserved while the steel is preserved. Acitrol also prepares the surface for good coverage of subsequent finishes.

RESISTS BREAKDOWN UP TO BOIL

Houghton Acitrol 3129 maintains its effectiveness over the full temperature range—resists breakdown even in pickling installations run at long periods over 200° F. This means you can benefit through the increased production rates Acitrol makes possible. And low temperature baths may be maintained effectively even if less inhibitor is used.

USED ACROSS-THE-BOARD

This fast-dissolving liquid works well in either sulphuric, hydrochloric or phosphoric acid baths. Whether the acid dilution is mild or strong, Acitrol 3129 does the job. It requires no premixing. Picklers find it convenient to use.

HOUGHTON ACITROL 3129

STAYS STABLE IN STORAGE

Add Acitrol 3129 to concentrated acid, hold it in storage, and you'll find it ready for effective protection when you want to use it. It remains stable. It stays uniform from batch to batch.

YOU BENEFIT COST-WISE, TOO

Acitrol's stability, efficiency and ability to conserve steel and acids are all indications of its low cost per ton of steel pickled. Houghton Acitrol 3129 is available in 15, 30, and 55 gallon drums and well worth a trial. Get prices and further information from your Houghton Man or write E. F. Houghton & Co., 303 W. Lehigh Ave., Philadelphia 33, Pa.

Houghton Acitrol 3129

WRITE FOR BULLETIN

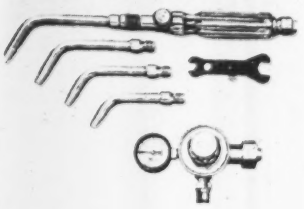
ACITROL 3129 *product of*

E. F. HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

NEW PRODUCTS and equipment

electrical apparatus and automotive and electrical equipment. Example: It will silver braze copper tubing to brass fittings in about 38



seconds; will solder the same type of joint in about 26 seconds. National Cylinder Gas Co., Dept. ST, 840 N. Michigan Ave., Chicago 11, Ill.

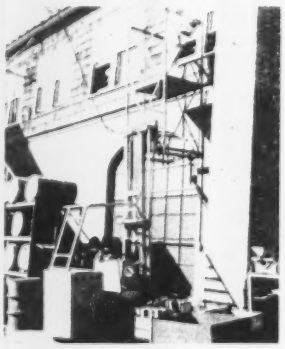
FOR MORE DATA—CIRCLE REPLY CARD NO. 20

Scaffolding Attachment

. . . facilitates maintenance

This scaffolding attachment, designed for use on the manufacturer's electric fork trucks, can be used by maintenance departments for inside and outside repairs on a variety of hard-to-reach trouble spots.

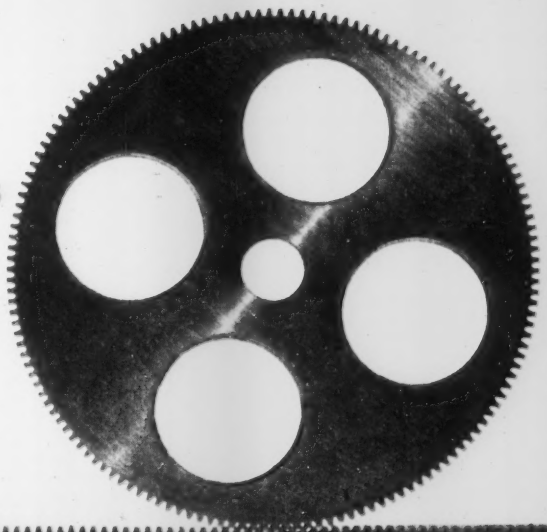
Truck's forks slide into sleeves on the underside of the scaffold, holding it securely. A ladder built into one side of the structure makes it easy to reach the platform when forks are down. High

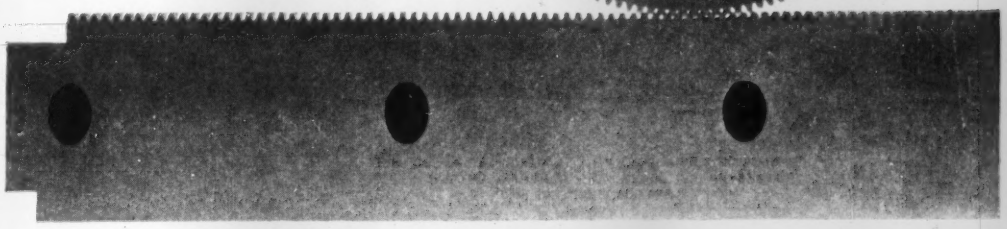


guard around the worker insures his safety in difficult high-lift operations.

One feature is remote control via the cable, as illustrated. Truck is parked, automatically braked, and with lifting and lowering remote control, the worker can raise and lower himself as desired. It is

Here's *Why* you can check precision gears *more conclusively* with Kodak Conju-Gage Gear Checkers

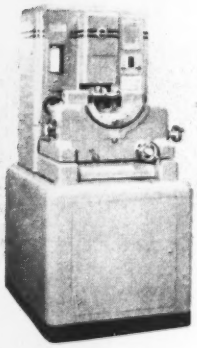




Why the composite check

Errors in gears seldom occur individually—they're usually combinations of as many as six types of errors. The practical way to test gears for these errors is to test them in action through the composite check recommended in the new American Standard (AGMA 236.02; ASA B6.11-1951).

This check measures gear errors as variations in center distance when the gear is rotated in contact with a master of known accuracy. Since this variation is the sum of errors in both gear and master, the degree of precision measurable depends on the precision of the master.



The Kodak Conju-Gage Gear Checker automatically records the composite effects of runout, base pitch error, tooth thickness variations, profile error, lead error, and lateral runout. Illustrated is the Kodak Conju-Gage Gear Checker, Model 4U, for gears up to 4⅛" pitch diameter. Larger and smaller models are also available.

Why the Conju-Gage Gear Checker

Kodak Conju-Gage Gear Checkers use a master of exceptional accuracy, the Kodak Conju-Gage Worm Section. These Worm Sections are generated by the continuous action of a thread grinder under control of a precision lead screw—circular pitch error and tooth thickness variations cannot be introduced by defects in an intermittent indexing mechanism. This means a more accurate gaging element, less chance that error in the master may coincide with a tolerable error in the gear to result in a needless rejection. Less chance, too, that an error in the master may subtract from an intolerable error in the gear, passing a gear that will fail in use.

By passing each right gear, rejecting each wrong gear, the Kodak Conju-Gage Gear Checker helps you reduce costs while maintaining highest precision. For the full story of this and other economies achieved by Conju-Gage instrumentation, send for the booklet, "Kodak Conju-Gage Gear Testing Principle." Write to:

Special Products Sales Division
EASTMAN KODAK COMPANY, Rochester 4, N.Y.

CONJU-GAGE INSTRUMENTATION

. . . a new way to check gear precision in action

To inspect all kinds of complex parts on a bright screen, Kodak also makes two highly versatile contour projectors.

Kodak
TRADE-MARK

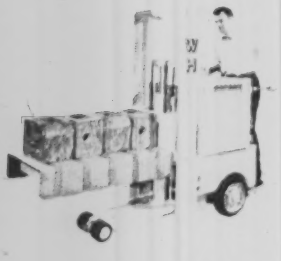
a one-man operation. Lewis-Shepard Co., Dept. ST, Watertown, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 21

Redesigned Platform Trucks

. . . up to 4000-pound capacity

A redesigned line of high lift platform trucks of the stand up rider type, will be available in 2000, 3000 and 4000-pound capacities in variety of platform sizes to handle different types of loads. Single lift and telescoping models are available. Featuring a hydraulically operated lift mechanism



powered by a separate electric motor these models permit operator to raise or lower load while truck is in motion. Magnetic controller provides four running speeds in either direction, and a time delay switch makes it impossible to jerk load by starting truck in high gear. Wright-Hibbard Industrial Electric Truck Co., Dept. ST, Phelps, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 22

Bar Stock Positioner

. . . feeds directly to saw

Portelvator handler and positioner receives heavy billets at receiving dock and transports them to the stockroom for storage until needed. As billets are required, unit moves them from the stockroom to the sawing machine where material is positioned to correct height and fed directly from the handling unit to the saw.

Slots between rollers enable chain of overhead crane to be wrapped around billets securely. Table has 2000-pound capacity and 14-inch vertical travel. Minimum height from floor is 20 inches; maximum height is 34 inches. It is elevated by hand crank from the side to permit extension of bar stock over each end.

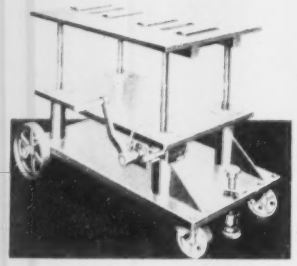


Table surface measures 18 x 20 inches. Hamilton Tool Co., Dept. ST, Hamilton, O.

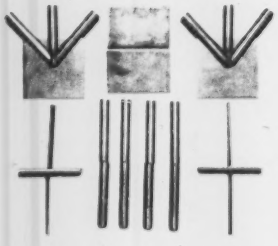
FOR MORE DATA—CIRCLE REPLY CARD NO. 23

Welding Test Kit

. . . conforms to MIL specs

This welder's test kit conforms to military specification MIL-T-5021. Its use is reported to save considerable time, since everything necessary for government certification of welders is included.

Kit consists of two clusters, one plate, two crosses, two sets of tubes, all made of chrome molyb-



denum. Also included are all necessary application forms. CBC Welding Corp., Dept. ST, 422 E. 102 St., New York 29, N. Y.

FOR MORE DATA—CIRCLE REPLY CARD NO. 24

Adjustable V-Belt

. . . built for D and E drives

Adjustable v-belt for D and E drives is designed to make coupling and uncoupling easy. Link v-belts are made of plys of especially-treated high-tensile strength canvas duck, joined by riveted studs with removable cup washers and T-screws. Result is high strength and durability at all key points.

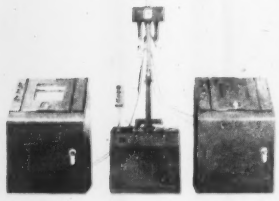
Two types are available: Regular rubber coated for general service; oil-proof for oily and high-temperature drives. Application to metalworking includes use on large machine tools, presses, shears, rolls, air compressors, etc. Manheim Mfg. & Belting Co., Dept. ST, Manheim, Pa.

FOR MORE DATA—CIRCLE REPLY CARD NO. 25

Beta Ray Wall Gage

. . . measures tube wall

This gage uses beta rays from a radioactive source to measure wall thickness and roundness of tubing. It provides a means of gaging small diameter, thin-walled



tubing with extreme accuracy and is especially valuable where uniform thickness of tube walls is important and concentricity must be accurate.

A source of beta radiation, moved inside the tube in relation to a sensitive means of detecting radiation on the outside, is the heart of the device. Changes in thickness affect amount of radiation passing through the wall. Translated into thickness readings, these changes are shown by a pen trace on a recorder chart. Tracerlab Inc., Dept. ST, 130 High St., Boston 10, Mass.

FOR MORE DATA—CIRCLE REPLY CARD NO. 26

Rigid Shaft Coupling

. . . gives full shaft contact

All-round rigid Sleevelock shaft coupling is made for every service and operating condition, incorporating consideration of installation, upkeep, safety and economy. It is self-aligning, gives full shaft contact for the entire length of the bushings.

Principle of tapered bore with split bushing has proved effective in service in sheaves, pillow blocks and other keyless compression couplings. Medart Co., Dept. ST, St. Louis 18, Mo.

FOR MORE DATA—CIRCLE REPLY CARD NO. 27

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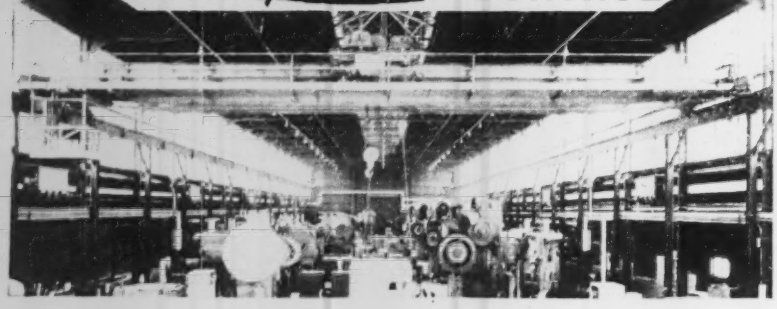

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CALENDAR
OF MEETINGS

December 7-8, National Screw Machine Products Association: Services clinic, Hotel Carter, Cleveland. Association address: 2860 E. 130th St., Cleveland. Executive secretary: Orrin B. Wernitz.

December 7-10, Scientific Apparatus Makers Association: Midyear meeting, laboratory apparatus, equipment and optical sections, Boca Raton club, Boca Raton, Fla. Association address: 20 N. Wacker Dr., Chicago 6. Executive vice president: Kenneth Andersen.

December 8-10, American Institute of Electrical Engineers: AIEE-ACM-IRE Eastern computer conference, Statler hotel, Washington. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

December 9, Steel Kitchen Cabinet Manufacturers Association: Winter meeting, Edgewater Beach hotel, Chicago. Association address: 1008 Engineers Bldg., Cleveland. Executive secretary: Arthur J. Tuscany Jr.

December 9-11, Institute on Plant Maintenance: University of Wisconsin, Madison, Wis. Information: Clay R. Jackson, University of Wisconsin, Madison 6, Wis.

December 13-16, American Institute of Chemical Engineers: Annual meeting, Hotel Jefferson, St. Louis. Institute address: 120 E. 41st St., New York 17. Secretary: Stephen L. Tyler.

December 16-18, Material Handling Institute: Annual meeting, Hotel Statler, New York. Institute address: 813 Clark Bldg., Pittsburgh 22. Managing director: R. K. Hanson.

December 29, American Association for the Advancement of Science: Panel discussion on visual performance and testing procedures, Bradford hotel, Boston. Panel chairman: Dr. N. Franklin Stump, Bausch & Lomb Optical Co., 635 St. Paul St., Rochester 2, N. Y.

January 5-7, American Road Builders' Association: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: World Center Bldg., Washington 6. Secretary: Lt. Gen. Eugene Reybold.

January 11-13, Truck-Trailer Manufacturers Association Inc.: Annual meeting, Boca Raton hotel and club, Boca Raton, Fla. Association address: 1024 National Press Bldg., Washington 4. Managing director: John B. Hulse.

January 11-15, Society of Automotive Engineers Inc.: Annual meeting and engineering display, Hotels Sheraton-Cadillac and Statler, Detroit. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

January 12-14, National Constructors Association: Annual meeting, Hotel Commodore, New York. Association address: 50 E. 41st St., New York. Secretary: C. B. Bronson.

January 13, American Boiler Manufacturers Association & Affiliated Industries: Winter meeting, Hotel Cleveland, Cleveland. Association address: 1571 W. 117th St., Cleveland 7. Secretary: A. C. Baker.

January 14-16, National Tool & Die Manufacturers Association: Board of trustees and committee meeting, Hotel di Lido, Miami Beach, Fla. Association address: 907 Public Square Bldg., Cleveland 13. Executive secretary: George S. Eaton.

January 17-19, Institute of Scrap Iron & Steel Inc.: Annual convention and exhibit, Hotel Statler, Washington. Institute address: 1729 H St. NW, Washington 6. Executive vice president: Edwin C. Barringer.

January 18-22, American Institute of Electrical Engineers: Winter general meeting, Statler hotel, New York. Institute address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

January 19-21, Caster & Floor Truck Manufacturers Association: Winter meeting, Hotel New Weston, New York. Association address: 27 E. Monroe, Chicago 3. Executive secretary: H. P. Dolan.

January 20, American Society of Body Engineers: Annual meeting, Detroit. Society address: 100 Farnsworth Ave., Detroit 2. Secretary: Edmund Wachnicki.

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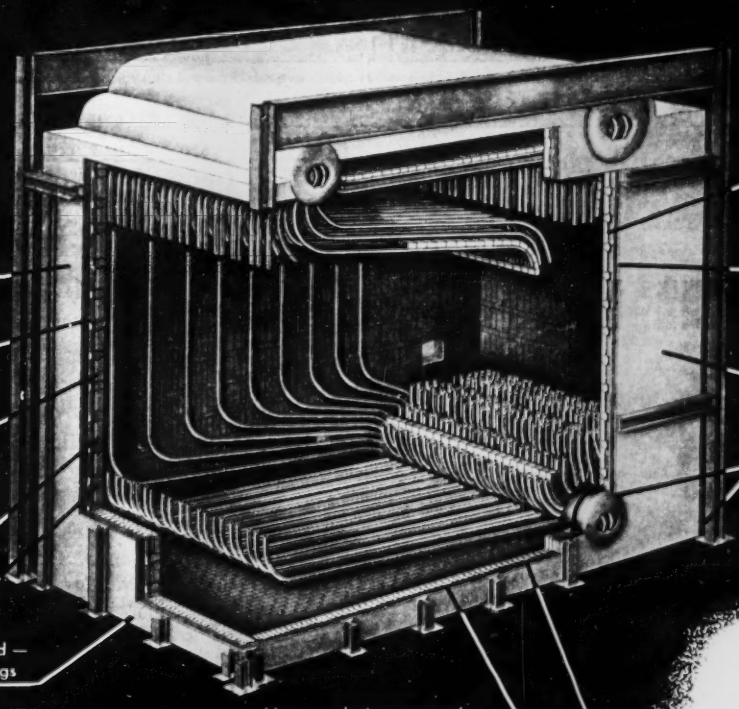

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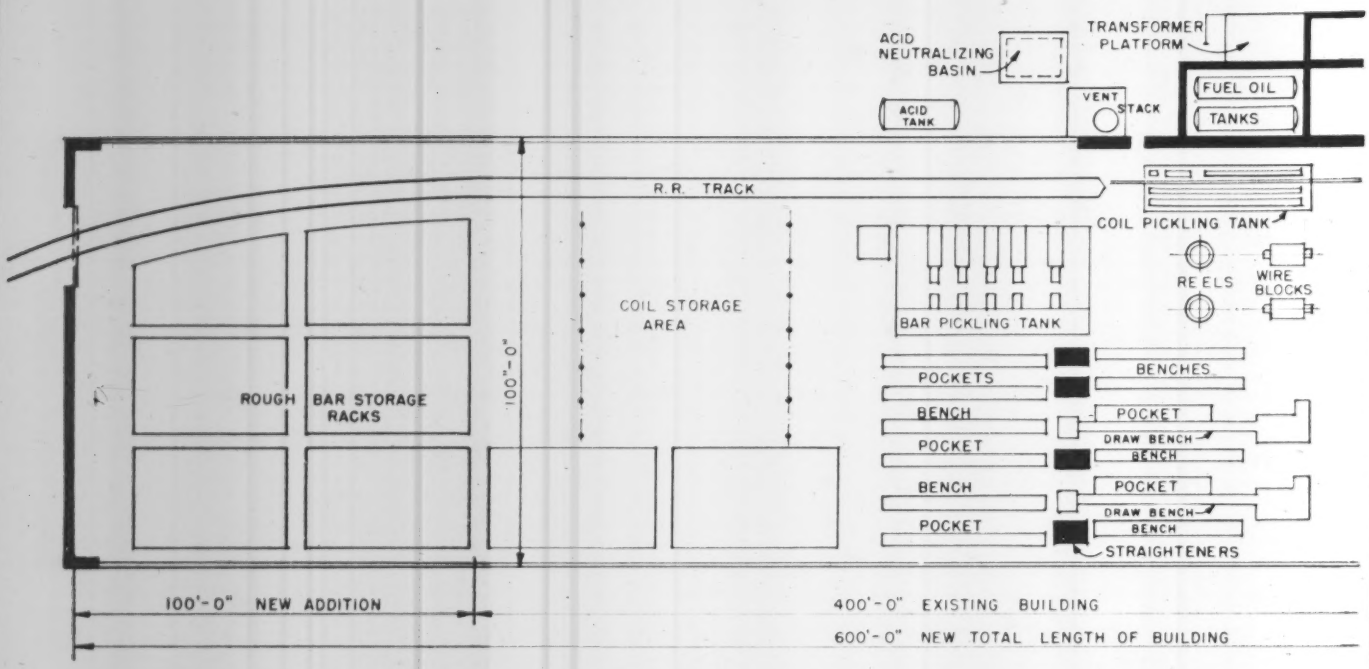


Bar Mill Built to Serve Market

By DR. ALLEN G. GRAY
Technical Editor

Cold finished steel is finding an increasing list of applications. Here's story of new mill built to supply this class of steel for a specific market

COLD finished bars are winning new friends among manufacturers who have their minds on their pocketbooks.

Product, noted for its smoothness and accuracy, provides the proper finished dimension and surface condition for a host of completed parts. Rundown of applications includes autos, agricultural implements, industrial and domestic electrical equipment, mining and oil producing equipment, power plant and paper machinery, hand tools, business machine and ordnance equipment.

Market Picture—In August of this year, shipments of cold finished bars, including all grades of carbon, alloy and stainless, amounted to 180,324 net tons, or 2.8 per cent of the total steel movement in the month. In August 1952, they amounted to 158,142 net tons, or 2.5 per cent of the total.

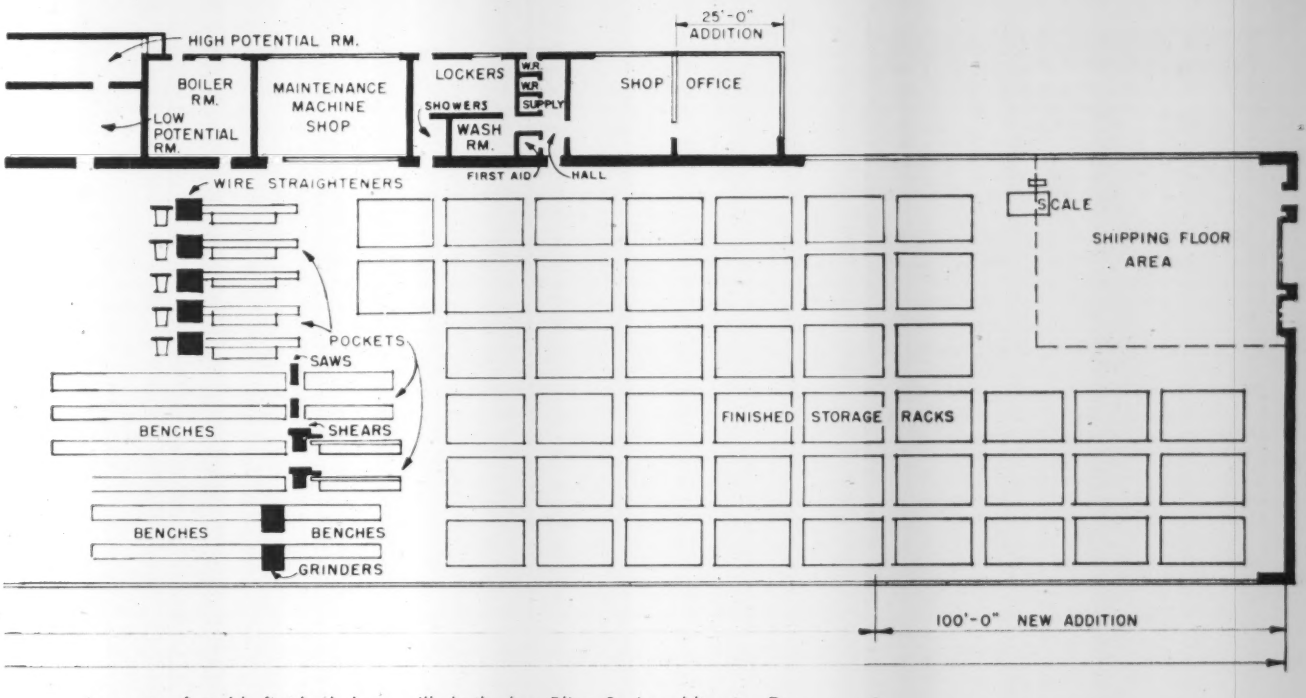
Shipments in the first 8 months of this year were 1,584,699 net tons or 2.9 per cent of total steel tonnage moved. In all 12 months of 1952, shipments amounted to only 1,922,205 net tons, or 2.8 per cent of all steel shipped.

More Evidence—Comparison of shipments data for 1953 with those for 1952 are not strictly equitable for the reason that 1952 shipments were adversely affected by the June-July steel strike that year. Still, the figures for this year indicate not only a gain in the tonnage movement but substantial increase in cold bars used proportionate to total steel products used.

Bliss & Laughlin Inc., a producer of cold finished bars since 1891 is one company that believes in growing in the direction of its market. Spot checks as early as 1945 backed up later with a carefully planned market survey showed the Detroit area to be exceptionally thirsty for the cold bars B & L was turning at its plants in Buffalo, N. Y. and Harvey, Ill.

Genesis—Then came the follow-through: A cold bar mill to take care of the Detroit market. In June, 1951, the site was acquired. Construction was started under the experienced eyes of president Carl Huff, up from B & L's Harvey, Ill., plant to get things rolling. First bars were drawn the latter part of April, this year. On August first, scarcely more than three months after the first bars rolled off the draw benches, there were more ground breaking ceremonies.

Bliss & Laughlin was again growing in the direction of its market. More manufacturing space was being roofed in on each end of the Detroit bar mill to up the original rated capacity of 35,000 yearly tons to perhaps twice that



Lay-out of cold finished bar mill built by Bliss & Laughlin in Detroit. Shaded areas indicate additional facilities now being added

figure eventually. The Detroit market for cold bars was even brisker than B & L's seasoned experts had guessed.

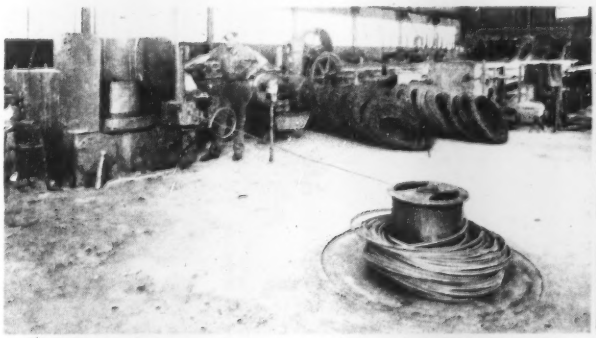
Start Here—Raw materials from which cold finished bars are made are properly prepared hot rolled bars or coils. Quality is governed by strict chemical analysis and definite physical properties. This is important so that the finished bar will be efficient in its response to subsequent fabricating operations and will give the service expected.

Finished bars have smooth, bright scale-free surfaces. They are held to commercial size tolerance or to special accuracy, as the case may demand, and are produced straight and concentric.

Pay-off—Most cold finished bars produced today are cold drawn because it is the most economical method of sizing a bar. But it also has the advantages of better physical properties and improved machinability. From a study of the physical property changes due to cold working, Bliss & Laughlin laboratory experts estimate tensile strength is advanced from 25 to 30 per cent, yield point is upped 60 to 80 per cent, Brinell hardness is increased about 15 per cent, with a retention of 70 to 75 per cent ductility.

Hot rolled bars or coils to be cold drawn are first carefully examined for size, rolled surface condition, chemical composition, bar hardness, soundness, structure, extent of decarburization and other metallurgical properties which may be involved. After passing these requirements in accordance with B & L's specifications, bars are housed in a well indexed rough storage area until scheduled for processing.

First Stop—When ready for production, first stop is at the pickling department. Bars are placed in a hot 8 to 10 per cent sulphuric acid solution and agitated with a



Cold finishing small rounds on Vaughn Motor draw blocks

Bars over $\frac{5}{8}$-inch diameter handled on draw benches

If college degrees were awarded to industrial plants as well as to students, the big Wetherill machinery plant at Sun Ship would certainly be a candidate for an "M.M."—Master of Metals.

Cylinder assembly, shown above, for a massive 2750-ton extrusion press is a sample of the plant's qualification for the title. But—fine example of power and precision that it is—it is just one example of many that can be seen year in and year out in the massive machinery-building plant that has been doing special work for a great variety of industries through the years.

Giant engine lathes with 132-inch swing up to 50 feet in length, small turret lathes, planers up to 14 feet wide, and a special crankshaft machine for shafts of largest sizes are among the modern machine tools which give Sun Ship's plant its versatility and speed in construction. Coupled with the skill and experience of the staff, the facilities of Sun Ship have set a notable record of service to many varied industries in building special machinery . . . and thus helping build a greater America.

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slow-moving chain cradle that reduces the time in the bath, minimizing chances of acid brittleness or pitting. When scale is removed, bars are taken from pickle tanks and pressure washed with cold water to rinse off residual acid and black smut from the metal surface.

When concentration of sulphuric acid is allowed to get down to 3 per cent, pickle solution is discarded to a special concrete holding basin located outside the main processing area. There the waste solution is neutralized with calcium hydroxide solution procured from an acetylene plant located in the area. Solids are removed by a filter mounted several feet off the ground. Collected solids are dumped into a truck and hauled away. B & L installed this disposal system in accordance with recommendations made by Detroit sewer authorities.

Draw Starts — After pickling, rinsing, and coating, bars are ready for drawing. Smaller size bars up to about ⅝-inch diameter are handled on a Vaughn Moto block. Coil is placed on a reel and the pointed end passed through the drawing die. A gripper mechanism, fastened to the revolving drum on one end by a chain, is engaged to the pointed end of the coil, extending through the die, then the drum set in motion and the entire coil drawn through die with aid of lubricant.

After drawing, the coil is removed from the drum and checked for size and surface condition. It is either stored in coil form or moved to the automatic straightening or cutoff machine. Prior to moving the straight cut lengths, bar ends are painted according to grade, tagged for identification and then submitted for general inspection and weighing.

Getting Bigger—Larger bars, in excess of ⅝-inch diameter, go to the draw benches. Bars are gently forced through the die for a distance of 4 to 5 inches by a special pusher mechanism. Gripper head is then attached to this extended end and engaged to an endless chain that draws the bar through the die. Round bars are then transferred to the straightening and polishing operation. Bars are cut to length, as required, and painted on one end in accordance with the color mark designating the grade.

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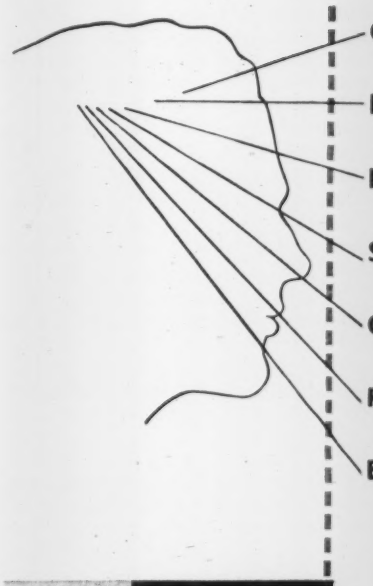

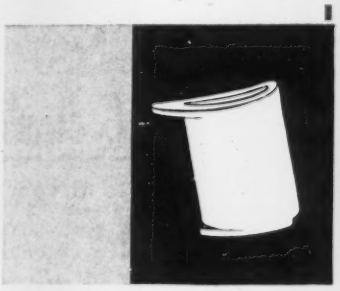

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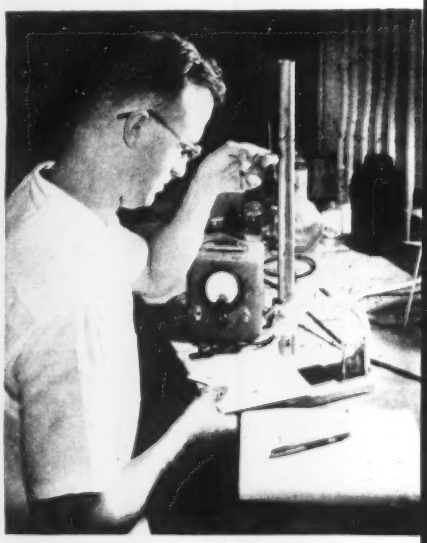

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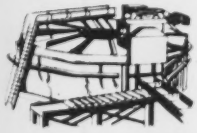
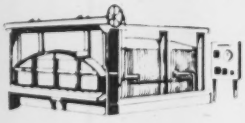
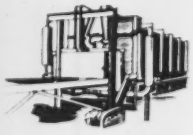
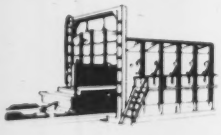
GASMACO furnaces are designed for long, trouble-free service on a wide range of applications. Equipped to handle material of nearly any size or shape, they are ideally suited for forging, heat treating, spheroidizing and annealing.





Exclusive features of GASMACO furnaces are Silicon Carbide Tubes and Rollers which permit operating temperatures up to 2500° F., with fewer replacements. Complete control of the furnace atmosphere is maintained. Annealing is accomplished without decarburization or scale in simple, inexpensive car, pusher, conveyor, chain or roller hearth type furnaces.





All GASMACO furnaces are individually designed to fit your particular furnace requirements and to assure maximum operating economy. It will pay you to investigate these furnaces for your next heat treating job.

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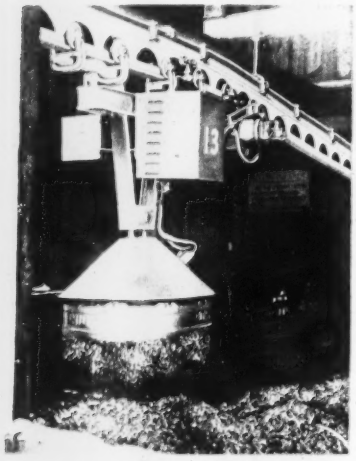

SCRAP-GATHERING MAGNET
. . . dumps, reverses automatically

Round Trip: 3 Minutes—When traveling in a direction away from the bin, magnets are in "off" position. When going toward the bin, they are "on" and pick up the metal as they move along. When they reach the bin, power to the magnets cuts off and their loads are dropped.

The two carriers operate independently of each other and are equipped with 36-inch diameter magnets. Carriers make a round trip in approximately 3 minutes. For a distance of 70 feet before they reach the bin, the carriers have to travel up a 13 per cent grade.

ONE OF A NUMBER of different tumbling barrels in which sample parts are processed in the new Norton barrel-finishing department.

Get the

"TOUCH OF GOLD"

Sample tumbling FREE in the new Norton test department

Can you "tumble" with the "Touch of Gold"? Can you be sure that you are adding value to your product each time the barrel turns in the barrel-finishing operation? Have you investigated this method as a way to more efficient processing and higher profit?

You can get samples processed without cost — in the newly enlarged Norton sample processing department with tumbling barrels of different types and capacities, plus auxiliary equipment such as a mechanically vibrated screen. Here Norton engineers, long experienced in tumbling procedures, determine for you just what barrel-finishing can do for the metal parts you send.

The range is wide. We have been successful in finishing parts ranging from tiny needles to castings and forgings weighing several pounds. Many manufacturers already have the "Touch of Gold" with substantial savings and production speed-up.

Tests result in detailed recommendations on barrel type, size, speed and amount of ALUNDUM* Tumbling Abrasive, amount of water, type and amount of compound or cleaner, time cycles and other data.

No obligation — send now. Mail us your representative sample parts plus (a) finished sample to be matched and (b) information on your present barrel-finishing equipment, if any, including type, size and speed of barrel. Send to NORTON COMPANY, Worcester 6, Mass., attention Sales Engineering Dept., Abrasive Division. Tests take about a week.

Also available is a 55-page Norton handbook on barrel-finishing. Ask your Norton Distributor for Form 501 or write us direct.

*Trade-Mark Reg. U. S. Pat. Off.

NORTON COMPANY, Worcester 6, Mass.
Distributors In All Principal Cities
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NORTON
ABRASIVES
Making better products to make other products better

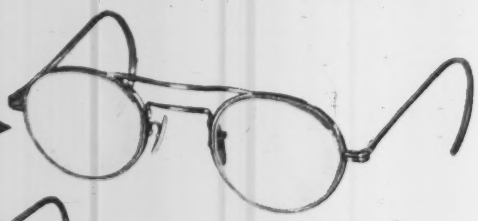
WILLSON
SAFETY SPECTACLES

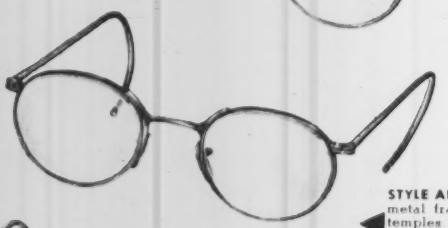
... Everything you want in

- PROTECTION
- COMFORT
- STYLE

STYLE WB—Distinctive bronze-color butyrate frame. Non-flammable. Toughest plastic made for spectacles. Standard cable or spatula type Hi-Line® temples. Light, sturdy, handsome. (With matching sideshields, Style WBS.)

STYLE A—Strong metal frame, on-line temples, with metal reinforcing bar or pearloid brow rest. Rocker nose pads. Exceptionally comfortable. (With sideshields, Style AS.)



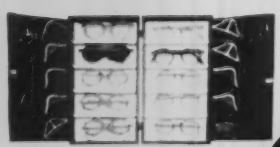


STYLE AH—Single-bridge metal frame with Hi-Line® temples. Rocker nose pads. Light yet safely sturdy. (With sideshields, Style AHS.)

STYLE AV—Modern metal frame with Hi-Line® temples, metal reinforcing bar. Rocker nose pads add extra comfort. A popular style of outstanding value. (With sideshields, Style AVS.)

STYLE WK—Sturdy flesh-color butyrate frame—"keyhole" bridge. Choice of spatula or half-plastic, half-cable temples. Adjustable for perfect fit. (With sideshields, Style WKS.)

Write for Willson Spectacle Data Chart and outline of our complete program on corrective-protective eyewear.



ASK YOUR WILLSON DISTRIBUTOR to show you the Willson Sample Kit of Safety Spectacles which includes lenses, frames and sideshields available.

More than 300 Safety Products Carry This Famous Trademark
WILLSON
Established 1870

WILLSON PRODUCTS, INC., 233 Washington St., Reading, Pa.

Fast Jet Blade Inspection

Using contour-checking principle, Precisionaire checks thirteen dimensions in one position

ADAPTATION of an air inspection gage for dimensional inspection of turbine bucket blades for the J-47 jet engine will save $13,500 annually for the General Electric Co.'s Accessory Turbine manufacturing plant in Lynn, Mass.

The device, called a Sheffield Precisionaire, combines a specially adapted thirteen-column air gage with basic gaging elements. It checks thirteen machining dimensions and completes final inspection in one positioning of the bucket. Formerly, six individual gages were required to do this inspection job.

Same Principle — Gage is an outgrowth of the Sheffield Precisionaire contour checker and is an adaptation of the same basic principle upon which the contour checker operates.

Tester is set and calibrated with a maximum and minimum master containing all dimensions to be checked. The masters must be exact to the extremes of the bucket tolerances for proper calibration of the instrument.

In actual operation, the turbine bucket is positioned in the jaw, clamped by a foot-operated air cylinder, and advanced to gaging position on a ball slide. The thirteen air columns are then scanned by the inspector, the bucket retracted, unclamped and removed.

AIR GAGING IN A BUCKET SHOP
. . . big savings on jet blades

gain the **solid surface** and you gain all!

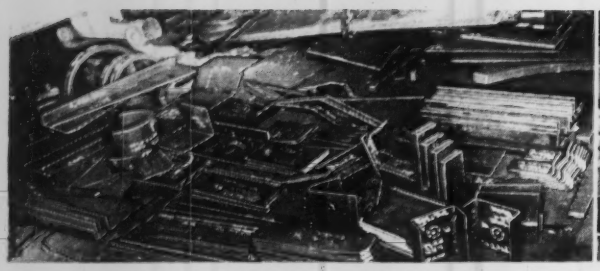
Let the *surface* do the job, with SuVeneer Clad Metal. Save the cost of expensive copper or brass throughout the gauge, when all you need is a solid face on one or both sides of the strip!

SuVeneer Clad Metal gives you actual copper or brass bonded inseparably to a strip steel core. The surface is solid, rolled metal—not a porous plating or coating.

Fabrication? Easy by any usual method.

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

Let us help you design for new economy with SuVeneer Clad Metal. *Descriptive bulletin sent on request.*



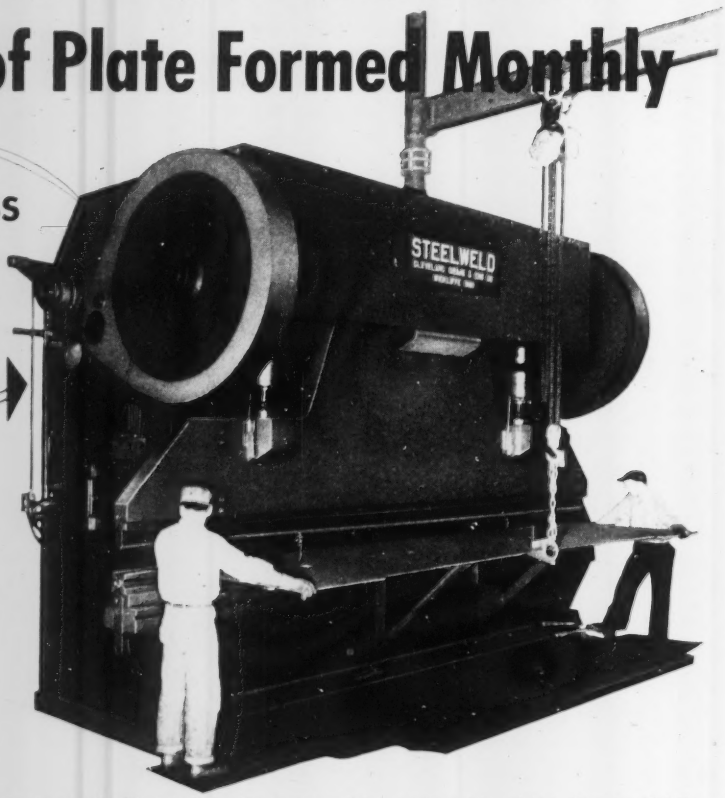
Some of the thousands of varied parts formed on the Steelweld Press. These involve bends and curves of every description in many plate thicknesses.

Bars of heavy cross-section, usually requiring a bulldozer, are formed into semi-circles for gear rims and similar uses.

800 Tons of Plate Formed Monthly

STEELWELD PRESS
Produces
Infinite Variety of Curves and Bends

This Steelweld Press is rated at 1" x 14' 0" mild steel. With the 24-inch bed and ram extension at each end, it will bend plate that can clear by the 18-inch deep throat to 18' 6" long. Two cross shafts with foot pedals are provided for operating the press. The lower shaft is for normal operation while the upper shaft brings the reversing flywheel into action to back the ram off the work whenever desired.



EVERY month some 800 tons of plate of all thicknesses to one-half inch is formed with bends and curves of every description on a Steelweld Press. The machine is in operation nine hours a day.

Since parts formed are produced in very small duplicate quantities, the dies and machine settings usually must be changed many times during a day. Because of the ease with which Steelweld Presses can be set up, the operators can do this quickly and easily.

Steelweld Presses offer so many advantages that we urge you to write for the catalog below and get all the facts on them. Hundreds of these machines are now in use for bending, forming and punching operations of every description.

GET THIS BOOK!
CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

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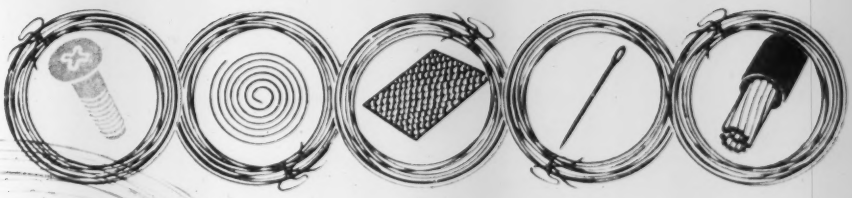
STEELWELD
BENDING PRESSES
BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING



CRUCIBLE FINE STAINLESS WIRE...

now available — all sizes... all tempers

Users of fine wire can now obtain prompt delivery of Crucible stainless steel wire . . . in all diameters . . . in all tempers from full hard to dead soft. And Crucible's fine wire comes in all standard grades — with a bright surface or a variety of metallic and nonmetallic finishes tailored to meet your specific application.

Our new fine wire mill is equipped with the latest facilities for annealing, pickling, drawing and finishing. Our mill metallurgical control setup is the latest word, too, to assure you that every spool and coil produced conforms to Crucible's high standard of quality — dimensional, physical and surface uniformity that is unsurpassed in the industry.

No matter what type of wire you use — whether it be cold heading wire, weaving wire, spring wire, needle wire, screen wire, cable wire, or a host of other types — our new mill is equipped to serve you. For prompt delivery of quality stainless wire, call your nearest Crucible warehouse.

CRUCIBLE first name in special purpose steels

53 years of Fine steelmaking

STAINLESS STEEL WIRE

CRUCIBLE STEEL COMPANY OF AMERICA, GENERAL SALES OFFICES, OLIVER BUILDING, PITTSBURGH, PA.

REX HIGH SPEED • TOOL • REZISTAL STAINLESS • MAX-EL • ALLOY • SPECIAL PURPOSE STEELS

Fit to Heat: Cast Alloys

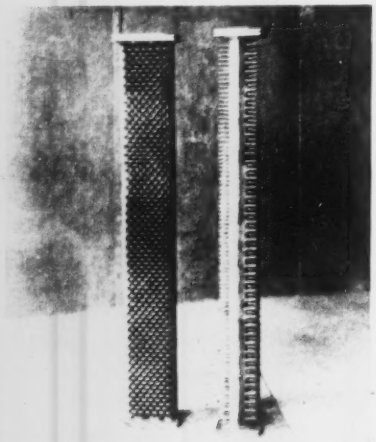
Chromium-nickel-iron cast high alloys resist high temperatures and gas corrosion

BECAUSE of the ever-increasing severity of modern industrial processes, engineers must rely on materials especially suited to vigorous conditions of high temperature and pressure. Such new demands are being made on metallic components of equipment used in oil refining, heat-treating, gas and steam turbines, jet aircraft and chemical processing.

Design of equipment is complicated by hot gas corrosion of metal parts used for continuous or intermittent service above 1200° F. Hot gas corrosion causes progressive scaling which can eventually reduce the sectional area of an exposed structural element, with consequent lost load-carrying ability.

Materials that retain mechanical strength at high temperatures and resist corrosion from various types of hot gas are the chromium-nickel-iron cast high alloys (greater than 8 per cent alloy content). They're divided by Alloy Casting Institute into corrosion-resistant and heat-resistant groups.

In the heat-resistant group, 12 cast alloy compositions are recog-



HD-alloy recuperator castings are needed to resist hot gas corrosion

nized as standard (H series); and within this general classification, there are three distinct types.

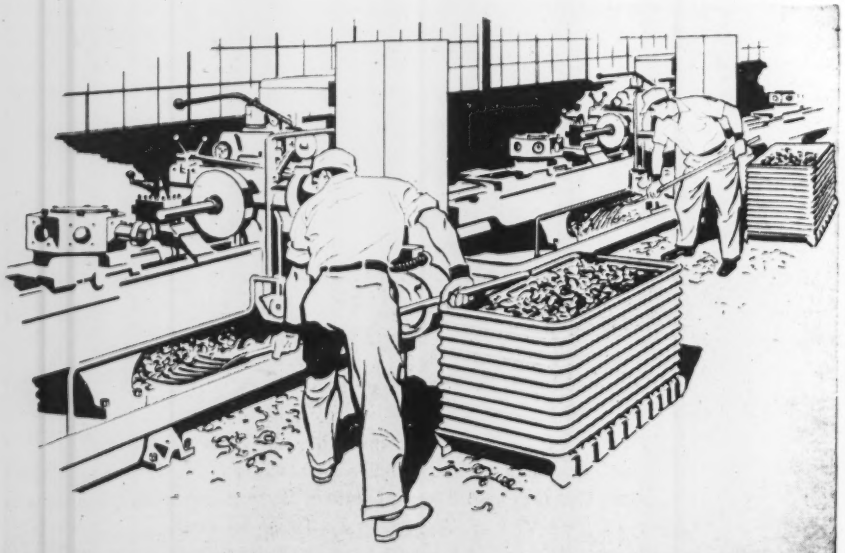
Types—First type: Iron-chromium castings containing up to 30 per cent chromium and under 7 per cent nickel (HC and HD). Type HB alloy, containing only 18 per cent chromium and useful only up to 1500° F, is sometimes also included in this group. These ferritic alloys offer excellent resistance to oxidation and sulphur-containing atmospheres, although they have moderate hot strength.

Second type: Iron-chromium-nickel castings containing 18 to 32 per cent chromium, 8 to 22 per cent nickel, with higher chromium than nickel content (types HE, HF, HH, HI, HK, and HL). Partially or fully austenitic, these alloys have greater high temperature strength and ductility than the straight iron-chromium group, will withstand greater loads and temperature cycles and can be used in sulphur-bearing, oxidizing and reducing atmospheres.

Third Type: Iron-nickel-chromium castings containing from 30 per cent to 70 per cent nickel and 10 to 20 per cent chromium (types HT, HU, HW, HX). These alloys are fully austenitic, maintain excellent hot strength in applications

MAY-FRAN

ENGINEERED SCRAP HANDLING



ELIMINATES SHUT-DOWNS

Remove scrap automatically and continuously . . . speed up production . . . with a MAY-FRAN automatic handling system. MAY-FRAN CHIP-TOTES remove chips, turnings and borings from operating machine tools . . . eliminate down-time for manual scrap removal. MAY-FRAN hinged steel belt conveyors then transmit scrap to disposal point or through shearing and baling processes.

up to 2100° F and have good life under rapidly fluctuating temperatures. They withstand reducing and oxidizing atmospheres, do not carburize excessively and do not take up nitrogen in a nitriding atmosphere. High nickel content makes this group unsuitable for use in atmospheres containing substantial amounts of sulphur.

Most of chromium-nickel-iron cast alloys suitable for high temperature service also withstand effects of one or more varieties of heat treating atmospheres—oxidizing, reducing, and various types of sulphur-bearing fuel gas environments.

Applications—Three basic groups of heat resistant alloy castings have been successful in a number of applications. Recuperators are a typical use where conditions combine hot gas and moderate stress found in recuperator installations. These recuperators are usually installed in waste gas flues to recover heat to be used for preheating air.

Waste gases to which the alloy may be exposed will produce every variety of hot gas corrosion. To meet such demands, a heat resistant material of moderate strength, but with high corrosion resistance, is necessary.

For strength requirements calling for better mechanical properties than type HC, type HD may

HH-alloy annealing retorts (three on left); others are of carbon steel

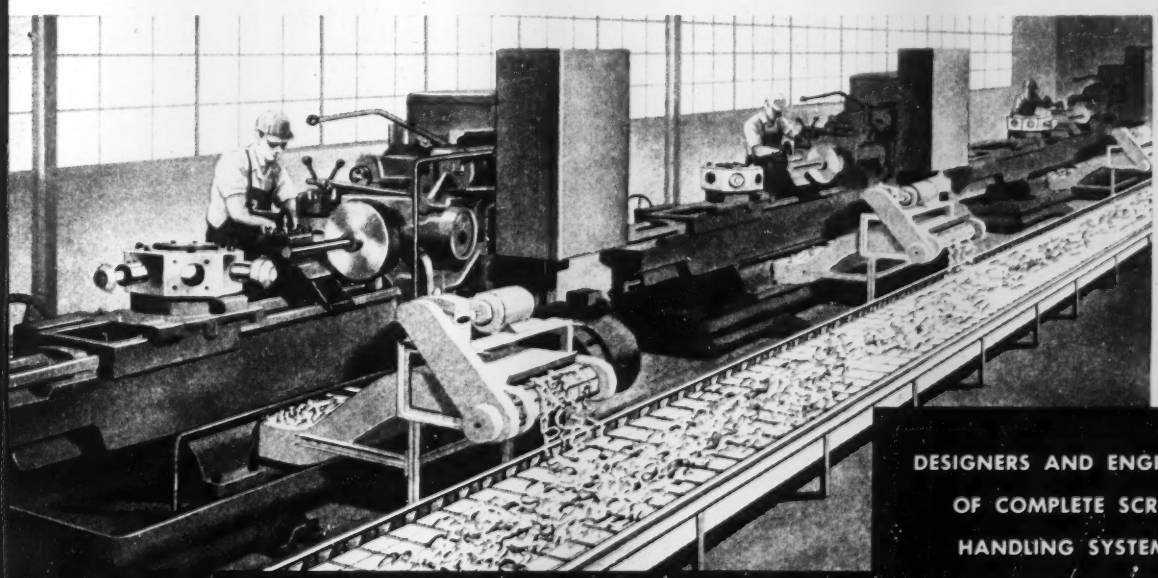
be used. It contains 28 per cent chromium and 5 per cent nickel, can be used for applications where moderate stress is encountered up to 1400° F and for somewhat lighter load-bearing duties to 2000° F.

Because of high chromium content, type HD resists oxidation and is especially useful in high-sulphur-containing atmospheres.

Special Furnace for Pipe Mill

A new type of ingot heating furnace will be used with a pipe mill being erected at Phoenix Iron and Steel Company, Phoenixville, Pa., a subsidiary of Barium Steel Corp.

The contract has been awarded to the Selas Corp. of America for a 72-foot over-all diameter furnace, which is designed and equipped to heat 22-inch diameter ingots of approximately 4 tons each to piercing temperature of 2300° F in less than 2 hours against a conventional heating time of 8 hours or more. Savings in fuel requirements and in scale losses are expected because of the heating principle employed and a built-in heat exchange feature. The unit is rated at 50 tons per hour.



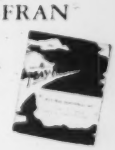
DESIGNERS AND ENGINEERS OF COMPLETE SCRAP HANDLING SYSTEMS

MAY-FRAN ENGINEERING, INC.

1725 CLARKSTONE RD.

Cleveland 12, Ohio

Mass produced parts (heavy or abrasive) can be handled through heat treating, machining, inspection and other operations with MAY-FRAN conveyors. Press scrap systems can be made completely automatic. MAY-FRAN engineered handling systems assure outstanding speed and jam-free efficiency with maximum service life. Write today for complete details.



NEW Thomas electro lead alloy coated strip steel solders readily, resists corrosion, fabricates easily

The newest addition to the Thomas family of pre-coated steels—*electro-plated lead alloy cold rolled strip steel*—gives you another method of improving your products and reducing your costs. The homogeneous and dense lead-tin alloy coating provides excellent resistance to corrosion, improves the soldering and spot welding qualities of the strip.

The ease with which Thomas Electro-coated lead alloy can be soldered without an acid flux and with a minimum consumption of solder is a distinct advantage to the fabricator. It retains its solderability over a considerable period of time. The coating also provides an excellent base for paints and synthetic enamels and acts as a lubricant in drawing operations.

Thomas Electro-coated lead alloy is available in the gauge range of .005 to .050 up to 20" in width. For information on this new product and the other economical Thomas pre-coated steels listed below, write today.

Cold-rolled strip steel electrolytically pre-coated with Zinc, Copper, Brass, Nickel and Lead-Alloy in Natural, Planished and Buffed Finishes—Hot Dip Tin and Lead-Alloy Coated—Lacquer Coated in Colors—Annealed Spring Steel—Alloy Strip Steel—Uncoated Strip Steel. Carefully produced to your specifications.

Thomas Strip

Thomas Strip Division

Pittsburgh Steel Company • Warren, Ohio

Fabricating Alloy Steels

Valuable alloys require modified techniques for machining, drawing, spinning operations

CHROMIUM-STAINLESS steels are useful alloys for many applications. Undoubtedly, in products where they have served as a satisfactory alternate to 18-8, manufacturers will continue to use them. During normal times straight chromium production comprises about 40 per cent of total stainless output.

Revisions — While simple parts are easily formed with type 430, 17 per cent chromium stainless, more complicated shapes may require some modification in methods. Type 430 is harder to form than 302 stainless. Type 302 has unusually fine drawing properties and may be reduced as much as 35 to 40 per cent on the first draw. Type 430 can usually be reduced 20 to 25 per cent on the first draw; 15 per cent on subsequent draws.

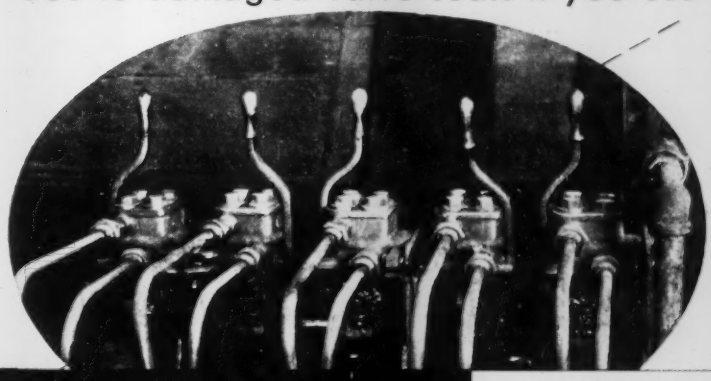
In handling deep draws in 430, an extra step is often added at the beginning of the operation. Liberal radii should be used at the base and flange. These draw radii may even be double those customary for 18-8.

Spinning—Lack of work hardening of 430 is a definite advantage in spinning operations. Often a deep draw can be made by first spinning material to rough shape, then drawing. Television viewing tubes are made this way. Here a modified 430 type is used because its coefficient of expansion is the same as that of glass. To obtain the tube depth required, the cone is first spun, then drawn to final shape. Some television tube producers are switching from 430 to enameling iron or glass. However, developments in color television are again focusing attention on the stainless steels.

Machining — Type 430F represents the best machining characteristics of the stainless steels. It is employed on automatic screw machines. Like type 430, 430F cannot be hardened by heat treatment. It can be annealed to the range 170 Brinell. Best machinability is around 228 Brinell.

Stamping — Shearing, blanking, coining and swaging operations present no particular problems in

You'll have fewer shutdowns due to damaged valve seats if you use



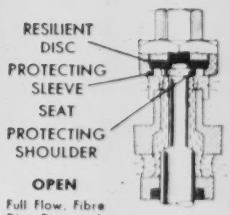
HOMESTEAD
Protected Seat
HYDRAULIC OPERATING VALVES

They give Longer, Low Cost Service

Production stoppages, due to damaged seating elements, are practically eliminated by the exclusive "Protected-Seat" built into every Homestead Hydraulic Operating Valve.

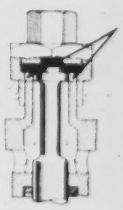
Protection against "wire drawing" or "cutting" of the seat is provided by a closely fitted protecting sleeve and stem shoulder which surround the metal seat and resilient disc in such a way that fluid-flow is all but shut off while the seat face and disc are still widely separated. With velocity thus reduced to almost zero, the most frequent causes of leakage and resultant shutdowns are eliminated. Grit, or other foreign material in the line is usually absorbed by the disc without damage to the valve seat. Records of 18 months continuous maintenance-free service are common.

HERE'S HOW THE PROTECTED SEAT WORKS

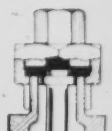


OPEN
Full Flow. Fibre Disc Protected.

Large space to reduce velocity to practically zero. This ring of water is squeezed out in closing—cushions seating.



CLOSING OR OPENING
Flow practically stopped by close fitting sleeve and stem shoulder, before seat and disc make contact. This prevents wire drawing. Trapped water cushions closing.



CLOSED
Protected resilient disc against metal seat assures drop tight performance, long life, accurate control, and low maintenance.

HOMESTEAD VALVE MANUFACTURING COMPANY
"Serving Since 1892"

MAIL THIS COUPON TODAY!
WE'LL SEND YOU FULL PARTICULARS BY RETURN MAIL

HOMESTEAD VALVE MANUFACTURING CO.
P. O. BOX No. 22, Coraopolis, Pa.

Please send me without obligation, VALVE REFERENCE BOOK No. 39 and complete data on HYDRAULIC OPERATING VALVES.

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COMPANY.....
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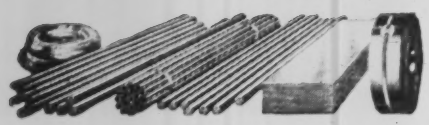


BRIDGEPORT BRASS COMPANY

COPPER ALLOY BULLETIN

Bridgeport BRASS CO. MILLS IN BRIDGEPORT, CONN. AND INDIANAPOLIS, IND.—IN CANADA: NORANDA COPPER AND BRASS LIMITED, MONTREAL

Sections of threaded worm gear that go into venetian blind hardware. Courtesy of J & S Screw Machine Co., Plantsville, Conn.

Ingenuity and Careful Planning Cut Cost on the Special Job

Low-cost, large-volume production of screw machine pieces often challenge ingenuity, especially when the items require one or more out-of-the-ordinary operations. Clever tool designing, careful planning, and a good knowledge of the workability of the metal are yardsticks of the fabricator's success.

A Tough Threading Job

Threading the worm gear stock (illustrated above) from round brass rod presented a problem. When cut into sections from 5/16" to 1" in length and drilled, these gears fit into the venetian blind hardware that controls the opening and closing of the slats. The gear threads are coarse, and they number only 4 turns to an inch compared with the usually large number turned out by conventional threading dies. Also, the threads on these gears are round, with a distinct radius on top and bottom, unlike the standard 60° threads.

To do this rugged threading job, it was necessary to devise a special-purpose machine and cutting tools. These were developed after it was proved that machining was economical...producing threads more uniformly satisfactory than making them by other methods.

Two Machining Cycles

Part of the success of the threading method was due to the fact that a 12-foot round brass rod could be threaded from end to end. Without further preparation, the entire rod became a threaded blank, ready for subsequent operations. Furthermore, this threading machine was nominally designed to handle rod up to $\frac{3}{4}$" in diameter.

Drilling and cutting operations were performed by Davenports into which were fed the specially threaded rods. Thus the worm gears were completed to specifications in but two machining cycles (1) threading, (2) drilling and cutting.

High-Leaded Brass Widely Preferred For Screw Machine Parts

Besides threading, Ledrite free-machining brass rod is eminently suited for innumerable screw machine operations because of its high machinability rating. It conforms with the highest engineering standards for complete screw machine operations, including milling, side drilling, slotting, and broaching. Fast machining speeds, low tool wear, and close tolerances are also associated with brass.

Illustrated below are but a few of the many precision-made parts fabricated of brass. These samples demonstrate various operations, such as deep trepanning and eccentric drilling, where dependable and accurate rod are required.

Bridgeport's Ledrite 6 Helps Cut Fabricating Costs

For uniform high quality and low-cost production, 90% of the jobs that call for free-cutting brass rod can be entrusted to Bridgeport's Ledrite 6 Standard (approx. 61% copper, 3.4% lead, remainder zinc). It has a machinability rating of 100%. Thus Ledrite 6 is easy to cut and lends itself to longer tool life. Also, screw machine products from Ledrite 6 are smooth, clean-surfaced, and economical to buff or polish.

At a slight sacrifice of machinability, but with a gain in cold forming properties for such applications as severe knurling and thread rolling, Bridgeport's Ledrite 2, Medium Leaded (copper 63%, lead 1.8%, remainder zinc) is recommended. This brass rod has good ductility and may be furnished in a softer temper for special applications.

Calling in Bridgeport at Planning Stage Saves Effort and Expense

Finding the right metal or alloy for the purpose required is often as easy as calling in Bridgeport on your plans. Close cooperation with our Laboratory at the start has worked wonders for many fabricators—increasing quality and uniformity, cutting waste, labor and materials. Write for your free "Technical Handbook." (841)

Precision made parts. Courtesy of J & S Screw Machine Co., Plantsville, Conn.

CAUSES OF CORROSION

This article is one of a series of discussions by C. L. Bulow, corrosion metallurgist of the Bridgeport Brass Company.

COPPER AND COPPER ALLOYS vs. SODIUM CHLORIDE SOLUTIONS (Cont.)

Deposits Accelerate Corrosion

Porous and semiporous substances such as flakes of rust, fibrous materials, and clumps of gelatinous materials deposited on a metal surface can lead to serious localized corrosion beneath these deposits. This type of corrosion appears as patches following the outline of the deposits or as shallow to deep corrosion pits. This behavior is not peculiar to copper and copper alloys but may occur in many other metals and alloys.

Sometimes the same substance can function either as a corrosion inhibitor or as an accelerator. If this substance is deposited as a thin, continuous, adherent film, inhibition of corrosion may result. If the substance is deposited unevenly on the surface or in clumps, highly localized corrosion may occur.

Ferric hydroxide often functions both as an inhibitor and/or as an accelerator of corrosion. In the finely dispersed state (probably colloidal), it may deposit a continuous film on the metal which slows up or stops corrosion. However, when deposited as a relatively large clump or as a rust particle on the metal, such a permeable deposit may lead to localized corrosion.

Laboratory tests conducted in 0.5 N sodium chloride solutions at 175°F showed that copper and various copper alloys corroded at an appreciably lower rate when the solution contained 0.18-0.06 ppm of ferric hydroxide calculated as iron as compared with a solution containing 0.08-0.02 ppm iron.

Preliminary work showed that rust, freshly prepared ferric hydroxide, or zinc hydroxide behaved essentially the same as deposits of cotton or cotton gauze. Therefore, cotton gauze was used in our laboratory tests to form a porous deposit since it could be more easily handled and the area covered more accurately measured. Some of the results obtained are given in Table II. A comparison of the data given in Table I in last month's issue of this column with the data given here shows that the rate of corrosion beneath the deposit of cotton gauze was from at least 400 to 2400 per cent faster than in the absence of the cotton gauze.

Thin Film Inhibits Corrosion

Where the iron content was sufficiently high to produce a continuous, protective dark-colored, iron-rich film on the metal surface, the rate of corrosion beneath the deposit was less than where the film was thinner or absent. Only one of the alloys tested showed some acceleration due to the presence of ferric hydroxide in the sodium chloride solution.

It is evident from the behavior of ferric hydroxide that the greatest inhibition of corrosion is obtained when the iron-rich film is smooth, continuous, and adherent.

TABLE II

Rate of Corrosion Beneath Deposit of Cotton Gauze on Copper and Several Copper Alloys in 0.5 N Sodium Chloride Solutions of Low Ferric Hydroxide vs. High Ferric Hydroxide Content at 175°F.

Alloy	Low Ferric Hydroxide	Higher Ferric Hydroxide
Cu 99.9, P 0.03	0.0205 ipy*	0.0037 ipy
Cu 98.0, Si 2.0	0.0141 ipy	0.0056 ipy
Cu 96.9, Si 3.0	0.0022 ipy	0.0021 ipy
Cu 91, Si 2.0, Al 6.9	0.0069 ipy	0.0015 ipy
Cu 63, Zn 37	0.0114 ipy	0.0146 ipy
Cu 59, Zn 39, Pb 1.7	0.0215 ipy	0.0085 ipy
Cu 69.6, Zn 30.4	0.0197 ipy	0.0167 ipy

* ipy — inches per year.

NEW DEVELOPMENTS

This column lists items manufactured or developed by many different sources. None of these items has been tested or is endorsed by the Bridgeport Brass Company. We will gladly refer readers to the manufacturer or other sources for further information.

Tension Gage for measuring resistive force of springs or other devices is used by presetting gage to desired tension by means of micrometer screw. Gage has adjustable zero correction and is said to be counterbalanced against gravity. Six models are available for the following ranges in grams: 4-24, 10-80, 50-250, 100-500, 200-1600, 500-2500. **No. 1348**

Sheet Metal Fabricator for punching, notching and nibbling operates at 165 strokes per minute for single hole work. Punches and dies are said to be rapidly interchangeable, and work is done without templates. Tool holders of 1¼ and 3½ in. capacities are available with adjustable back and side gages for accurate hole location. **No. 1349**

Glareless Fluorescent Lamp produces light in the blue green spectral range. Is said to be high in illumination value and to reduce eye strain. Tubes are dated and guaranteed for 24 months. **No. 1350**

Coil Stock Racks of welded reinforced tubular construction can be used singly or stacked in high tiers. Custom-made to any practical dimensions, racks can be handled by crane or truck. Crane eyes and cross bars are optional. **No. 1351**

Coating Thickness Gage is said to be useful for spot checks on nonmagnetic coatings like enamel, paint, foil plating, glass, paper, plastics, etc. Claimed accuracy is ±5% ±.0001 in. on flat or curved surfaces. Gage has needle locking device for correct reading and comes with leather case containing pocket for test strips. **No. 1352**

Stock Feeder for punch presses and similar machines gives feed lengths up to 2½ in. per stroke and feed stock up to 0.031 in. thickness. Feeder can be mounted to feed from any direction, and stock insertion or removal is said to be performed instantly without tools. **No. 1353**

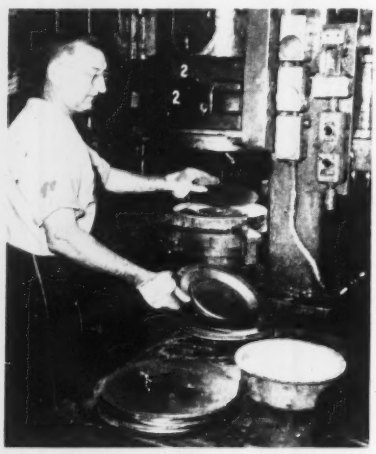
Adjustable Drill Jig for drilling through round or hex stock eliminates layout and cuts time on small lots. Hole diameters range from .052 in. to .531 in. using ASA standard slip bushings. Hardened V block has two 60 degree V's for centering stock—one for ¼ in. to 21/32 in. diameters, other for 21/32 in. to 2 in., and is said to permit use of inexperienced drill operators. **No. 1354**

BRASS, BRONZE, COPPER, DURONZE, NICKEL SILVER, CUPRO NICKEL
BRIDGEPORT BRASS
BRIDGEPORT BRASS COMPANY, BRIDGEPORT 2, CONN. • ESTABLISHED 1865
Mills at Bridgeport, Connecticut, and Indianapolis, Indiana • In Canada: Noranda Copper and Brass Limited, Montreal
Warehouse Service with Slitting Facilities in Principal Cities (Advertisement)

converting from 302 to 430. The straight chromium 430 types tend to show directional properties with reference to the direction in which the strip is rolled. A bend made parallel to this line in the course of longitudinal lock seaming may break. It is a good idea to plan the design so that most severe bends can be made across the strip rather than with it.

Ninety-degree bends on material 18 gage or lighter usually give no trouble, but if the radius is sharp, orange peel may show at the outside of the bend. This can be lessened by specifying an inside radius of at least one metal thickness.

Bends—On material lighter than 18 gage, 180-degree bends can usually be made if the bend is across the direction in which the strip is



Sharon Steel

NO STAMPING PROBLEMS EITHER
. . . it takes a little planning

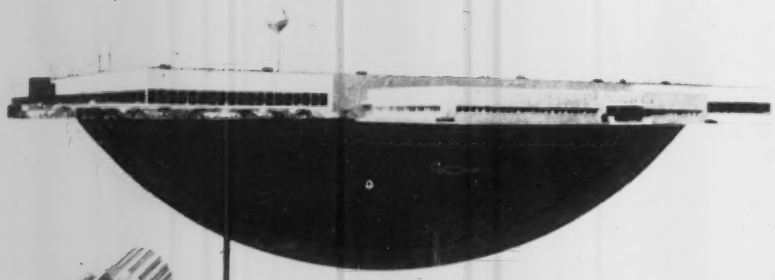
rolled. If the bend is parallel to the rolling direction, inside radius of the bend should be at least one metal thickness. Material heavier than 18 gage requires a radius of at least two metal thicknesses on 180-degree bends if the bend is across the rolling direction and at least four if it is parallel to the rolling direction.

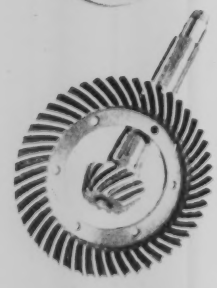
Welding—Type 430 stainless can be welded by any method except forge welding. However, welded joints may be somewhat brittle at room temperature. Annealing around 1400-1500 F helps to alleviate the brittle condition. It will not correct grain growth and as a general rule the weld will not be restored to the full ductility of the base metal.

Use of type 430T, frequently re-

Gear problems?

—check with FAIRFIELD





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Merry Christmas AND A Happy New Year

to you and you — and especially You

With the approach of the Holiday Season we all look forward to the year ahead — pause and reflect on the one just closing. Regardless of our accomplishments we all resolve to do a better job in our respective fields of endeavor. You, too, can do a better job in '54 and many years ahead with Bullard Machine Tools illustrated on the following page.

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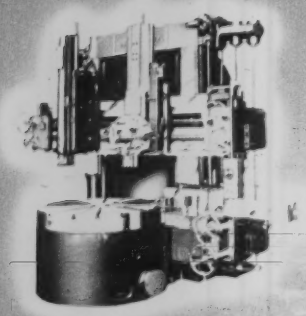
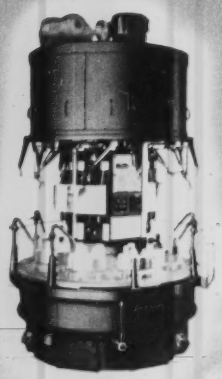
Specify BULLARD MACHINE TOOLS

for greater manufacturing economy and efficiency.....

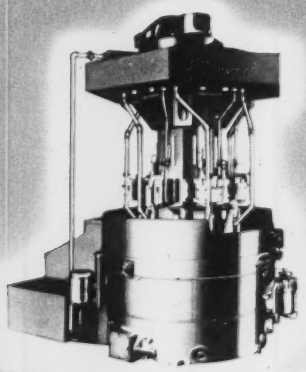
MULT-AU-MATIC
Type "D" — 8"—12"—16" with 6 or 8 Spindles, Type "D" 16-23" and Type "K" 6 Spindles — and 6 twin Spindles — 8 Spindles and 8 twin Spindles.

CUT MASTER V. T. L.
In six sizes 30"—36"—42"—54"—64" and 74". The 30" and 36" sizes have two heads while the 42"—54"—64" and 74" have three heads obtainable in various combinations.

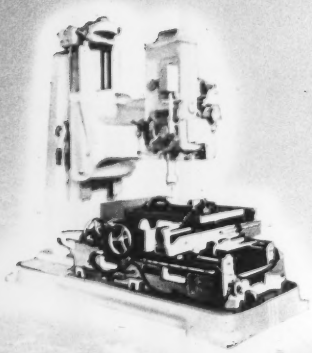


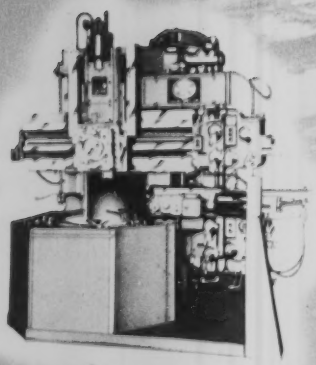


CONTIN-U-MATIC
Type "RD" with 4-8 or 12 spindles. Sizes 10"—14"—20".

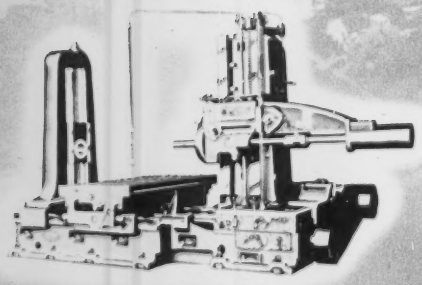


SPACING TABLE
30 x 20 Spacing Table mounted on Super Service Drilling Machines or 4'—5' and 6' Radial Drills.

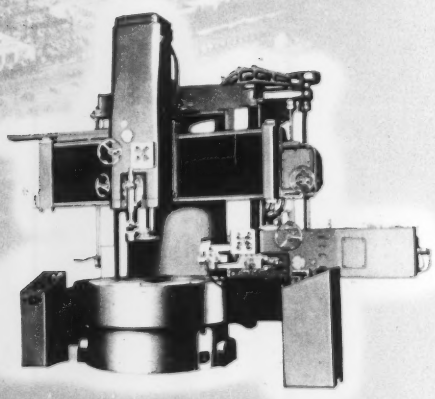




MAN-AU-TROL V. T. L.
In six sizes 30" and 36" with two heads. 42"—54"—64" and 74" with three heads.



HORIZONTAL BORING, MILLING AND DRILLING MACHINE
4" and 5" Spindle with various bed lengths and post heights.



VERTICAL CHUCKING GRINDER
Six sizes, 30" to 74" are available with a variety of head combinations.

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BRIDGEPORT 2, CONNECTICUT

Sales offices in: Chicago, Ill.; Milwaukee, Wisc.; Rock Island, Ill.; Cleveland, O.; Dayton, O.; Pittsburgh, Pa.; Detroit, Mich.; Indianapolis, Ind.; South Bend, Ind.; Boston, Mass.; Philadelphia (Narberth), Pa.; Syracuse, N. Y.; and Bridgeport, Conn.

Distributors in other principal cities in the United States, Canada and throughout the world.

ferred to as 430Ti gives better weld ductility. The titanium contained in this grade inhibits the formation of martensite by welding heat. Type 430T welds are fairly ductile in both the as-welded and annealed conditions.

Shielded Arc — Inert gas arc welding is often used for heat or light plate since high welding speed is possible. Metal arc welding is also widely used in welding type 430 sheet. This type welding with a coated rod is handier with thicker pieces which need filler rod in addition to parent metal. Since the amount of heat at the joint is usually substantially less for example than with gas torch welding the weld is more ductile. Resistance spot welding is also employed.

As a general rule, oxyacetylene or gas torch welding is not recommended for joining either type 430 or type 430T, since this method involves too much heating of the base metal near the weld with resultant grain growth in the weld zone. Since coefficient of expansion of the 17 per cent chromium stainless steel is low, the problem of warpage during welding is not as great as with 18-8.

Calibration Data Collected

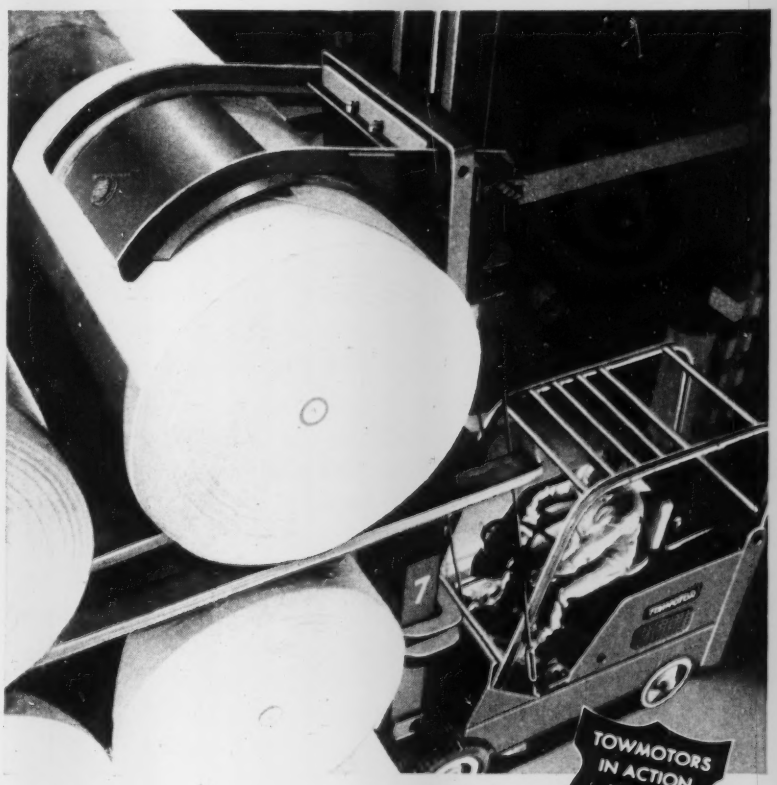
Bristol Co. has published a booklet entitled "Pyrometer Thermocouple Calibration Data." These tables are based on data released by National Bureau of Standards. Adopted by Scientific Apparatus Makers Association and Instrument Society of America, the tables are corrected to the absolute volt and to the International Temperature Scale of 1948. The Iron-Constantan table has also been corrected to a new curve adopted by SAMA.

Copies of the tables, bulletin P1259, are available from the company, Waterbury, Conn.

Engine Burns Three Fuels

Diesel Power Inc., Reynolds, Pa., has engineering work under way on an engine which can be operated with diesel fuel, gasoline or kerosene, L. M. Barton, president, announces.

Mr. Barton states the company has been granted a patent on the engine, which has a specially designed combustion chamber with fuel injection under high pressure.



Towmotor with Revolving Roll Clamp high-stacks 1½-ton roll of paper at Gibraltar Corrugated Paper Co., Inc.

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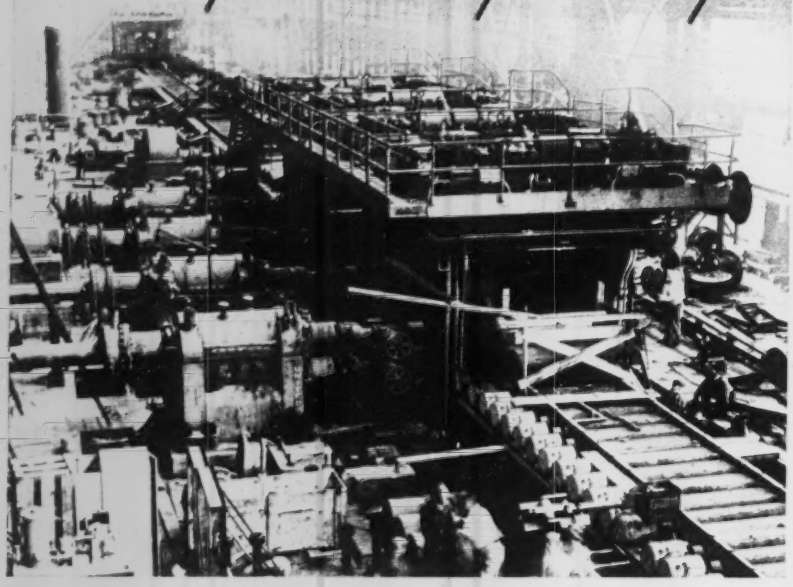

Pittsburgh Steel Company's new hot mill at Allenport, Pa., during installation

THE FINEST steel mill equipment becomes a real asset only after it is properly installed and in operation. The machinery pictured above is typical. Until actual production of finished sheets began, the 28 millions of dollars required to complete this facility earned not one penny.

On this project, as on thousands of others, Commercial Contracting Corporation completed its job—the installation of finishing stands, runout tables, and other equipment—in record time.

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Coolant Has Another Role

Application of water-base coolants can result in better cooling of the whole machine

"COOLANT is a temperature control agent for the entire machine tool." According to Claude R. Morgan, consulting engineer, Cone Automatic Machine Co., Windsor, Vt., this is an important but little-mentioned angle of the coolant function.

"The modern multiple spindle automatic, with six or eight spindles operating at a high rate of speed and confined in a relatively small area must be provided with a system of heat control. This is necessary not only to dissipate the heat generated at the tool point but also to prevent that heat from being carried back into spindles and bearings and into the carrier."

Don't Disturb — Mr. Morgan points out that, "A machine tool is adjusted to work smoothly at a norm temperature. Any additional heat induced by operation will tend to expand metals, cause distortion and upset the exact relationship of the workpiece, tooling and machine tool which is necessary for precision machining.

"When proper temperature control is achieved, work can be held to close tolerances without the dimensional changes or variations which occur during heating and cooling.

"Very often this temperature control obtained from an adequate water base cutting fluid will eliminate additional secondary operations. Greatly improved finishes are obtained from the combination of the cooling properties and cutting effectiveness present in these new cutting emulsions."

Ideas in Wire Rope Slings

"New Ideas in Red-Strand Slings" is the title of a folder describing the line of Red-Strand multiple part slings and Pin-Lock Thimbles.

The folder also describes new single-part slings equipped with single-swaged fittings, in addition to grommet slings. Copies are available from Leschen Wire Rope Division, H. K. Porter Company Inc., St. Louis 12.

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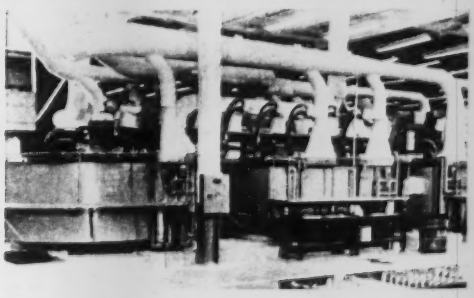

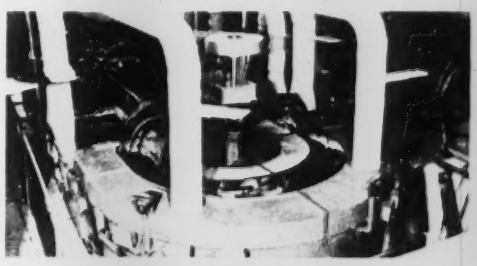

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- **In more than 800 stock sizes**
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Phone, wire or write your nearest Sandvik office for further information or technical help.

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Underground Insulator

Hot pipes get triple protection from corrosion, electrolysis, and root attacks

PRODUCT for insulating and protecting hot underground pipes from corrosion is announced today by American Gilsonite Co., Salt Lake City, Utah. The product, known as Gilsulate, provides a triple-zone of protection for hot underground pipes, gaining permament protection against such corrosive factors as alkaline ground waters, electrolysis, root attacks and bacterial action.

Gilsulate is a blend of sized, solidified petroleum. When poured around a hot underground pipe, a layer of the insulator melts and is fused to the pipe. Outside this first layer or zone, there is a zone of sintered particles and finally, a third zone of unconsolidated insulator.

Waterproof—The first two zones are completely waterproof. Zone one, bonded tightly to the pipe, is a dense, semiplastic coating which permits the pipe to expand and contract and acts as an excellent thermal and electrical insulator. Zone two provides excellent thermal insulation under wet or dry conditions. Zone three provides good thermal insulation and high load-carrying capacity.

The insulator is simple to install. For any insulation, a shallow trench is required with pipe supports at regular intervals. The composition is poured around pipes to required depth, surface is tamped and trench backfilled. Then hot steam or other fluid is run through the pipes.

No Sleeves—The product does not require sleeves or sheaths to protect the insulation; rocks need not be removed from the backfill to avoid puncturing and there is no need for expensive complex concrete ducts around the pipe.

Where required, repairs or changes to the pipe line can be made quickly and easily by removing the backfill and chipping off the structure. The new product is not subject to deterioration or corrosion in the ground.

Tests conducted by the Southwest Research Institute and University of Utah, show that heat loss from insulated pipe is only 8 to 11 per cent of the loss that occurs from bare buried pipes.

Electronic Railroad Inspector

Hand-carried electronic device which inspects rail joints to the core of the steel by supersonic means, is now in use by the Pennsylvania Railroad, adding to the safety of operation and moving the traditional track walker farther and farther into the background.

The railroad reported the audigage flaw detector indicates imperfections that may develop in the rail at the ends, at switches and crossovers, and through paved highway crossings, long before flaws become visible to the eye.

The audigage is carried and operated by one man. It consists of a long-handled detector unit about the size of a paper weight, electronic equipment carried in a small pack on the operator's back, and a pair of earphones. As the operator slides the detector unit along the top of the rail at a joint, he

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Compounds

FISKE'S 231 DIE CASTING COMPOUND excellent for die casting zinc and aluminum alloys. Results in cleaner, smoother pieces, free from surface imperfections and discolorations. Stronger and more accurate castings due to minimum gas formations. Does not flash, fume or solder.

FISKE'S GRAPHITE HOT DIE COMPOUNDS for best results in forging and upsetting operations. They eliminate carbon formation on dies, increase die life, with more pieces between changes. Application by brush, swab or spray.

There is a Fiske Lubricant for every metal working operation. Each is an outstanding product and results in more production, better finish and increased tool life. Complete literature available. Write today to Fiske Brothers Refining Co., 123 Lockwood St., Newark 5, N. J., or 1504 Oakdale Avenue, Toledo 5, Ohio.

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Established 1870

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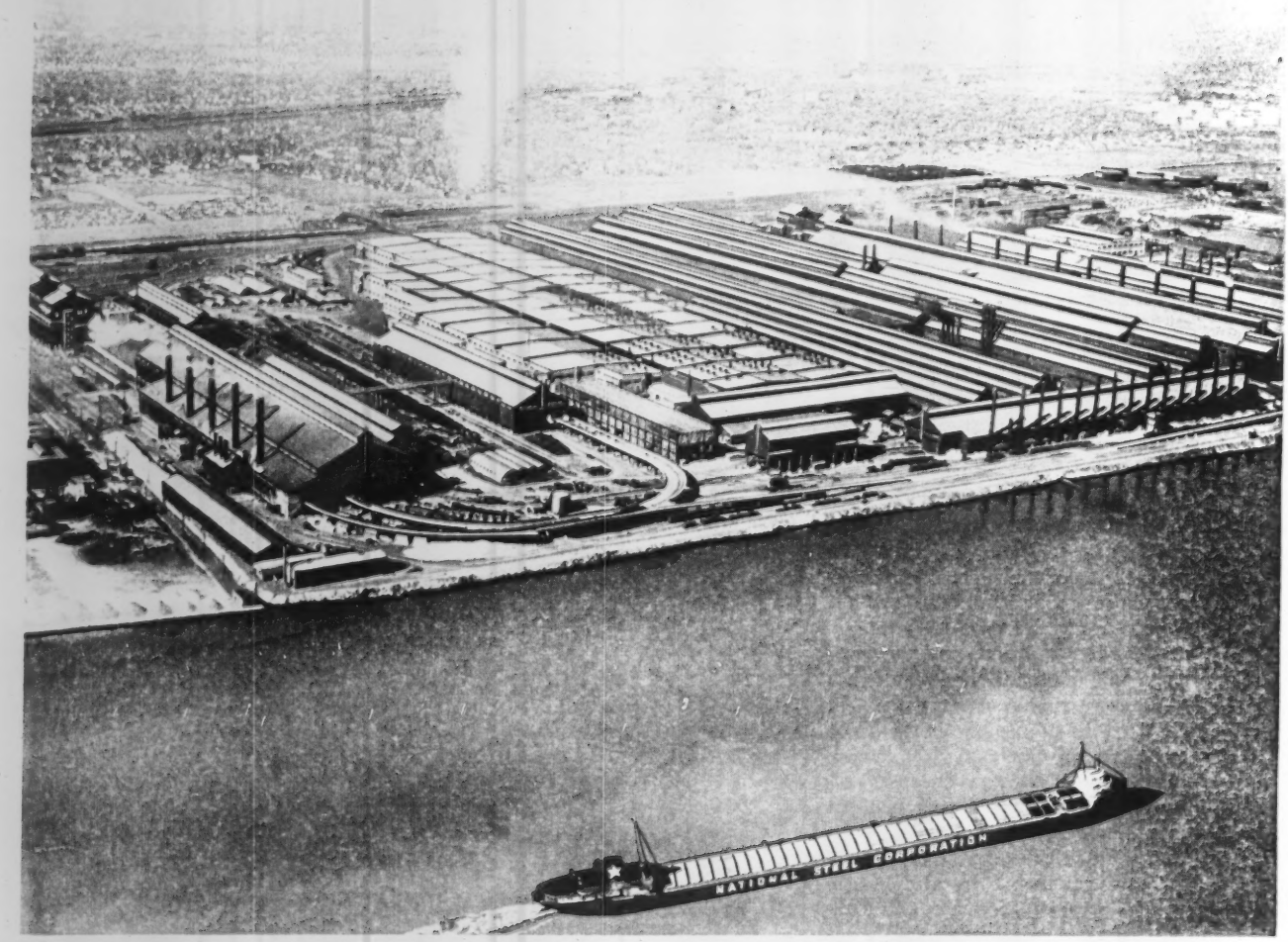

with the automotive industry

Right in the heart of the automotive industry, the steel company set up long ago to become a dependable first source for the car makers is now completing a new stage of growth. Great Lakes Steel—prime supplier of sheet, strip, and other shapes used in vast volume by the motorcar makers—is rounding out an expansion program that increases our annual capacity to *four million ingot tons*. That's about 25% of the automobile men's total needs for steel . . . and about 40% of their needs for the kinds of steel we make.

The way Great Lakes goes at it—starting with the ore and working it through to the finished forms—steelmaking calls for substantial facilities, even by the standards of the mighty automotive industry. We have our own blast furnaces, bessemers and open hearths, blooming mills, hot and cold rolling mills and merchant mills.

Recent expansion has included a huge new blast furnace, a new slabbing mill, and two new bessemers. Coming up in the next few months are seventy new coking ovens, another new blast furnace, additional finishing facilities, and all the extra handling equipment it takes to make things work together.

Through this integration of operations, Great Lakes has built *flexibility* and *availability* unique among steel suppliers. Through this expansion, we mean to take good care of many customers in many fields, while we carry on our service as a dependable first source for the automotive industry. *Great Lakes Steel Corporation, Detroit 29, Michigan.*

Great Lakes Steel

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hears in the carphones a steady, high pitched tone which descends to a growl whenever the detector passes over an imperfection. Should a flaw be discovered, the bolts and joint bars are removed to permit complete examination of the rail and its replacement.

Tiny Photocell for Industry

Large power output of germanium unit makes it suited to operating relays directly

A BEAM-SIZE germanium photocell so versatile it can regulate domestic or industrial heating devices or seek out industrial targets for guided missiles has been designed by General Electric.

The new electric eye, only slightly thicker than a pencil lead and but three-eighths of an inch long, is more sensitive to light than vacuum photocells a hundred times larger.

Dr. W. C. Dunlap, Jr., scientist who designed the cell, said its acute sensitivity to infrared radiation makes it ideally suited to the regulation and monitoring of various flames and heating devices.

Industrial Possibilities—The unit, still in the developmental stage, has a comparatively large power output that should make it extremely useful in many industrial applications. This high power production makes it suitable for operating relays directly, to control many production processes.

In contrast, power developed by selenium and vacuum cells must be amplified before such cells can operate most relays used in industrial controls.

Counting, Sorting, etc.—Because of its power output, the new germanium device could be used for counting, sorting and measuring applications. It could, for example, be employed to reject underfilled containers moving past it on a production line.

This magic eye also could serve in military and civilian roles as a substitute for a Geiger counter and similar atomic radiation detection devices. When nuclear particles penetrate a germanium wafer inside the cell, a current is produced. This current, when slightly amplified, can set off light and sound warning apparatus.

WICKWIRE ROPE
A CF&I PRODUCT

Me? Ride to work on wire rope?

That's right. In the course of a year this young lady may travel as much as 150 miles with the aid of wire rope that safely and swiftly whisks her elevator aloft and then just as safely returns it to ground level. It's quite likely that she gets to her job with an assist from Wickwire Rope. Here again—as in so many other fields where wire rope is used—men who manage and maintain the nation's tall buildings have learned to place unbounded faith in the safety and reliability they get from Wickwire Rope

A YELLOW TRIANGLE ON THE REEL IDENTIFIES WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver
Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland
Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga
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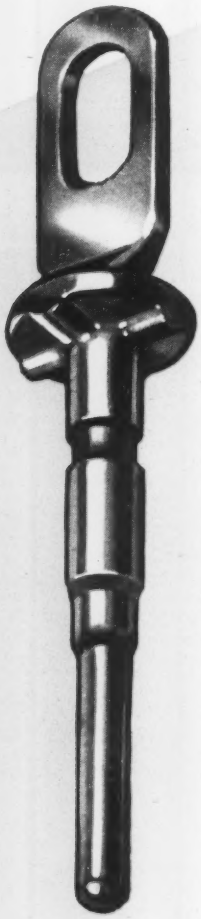
1854

WICKWIRE ROPE
CF&I PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

CAMCAR COLD-FLOW

IS BOLD WITH BRASS



Cold-Flow boldness produces . . . a lower cost . . . superior part . . . for Cinch Mfg. Co., Chicago, Illinois. This modern metal-flow technique adds to this brass part an increased tensile strength and a mirror finish, essential to precise molding.

Cold-Flow is flexible . . . and its boldness steps out in all metals and types of fasteners, frequently incorporating desirable features, at the same time lowering the cost.

If you are buying metal parts in large volume, it will be profitable to investigate Cold-Flow. Camcar Cold-Flow engineers combine practical imagination — skillful tooling — specially built machinery — to far exceed usual limits of metal forming.

Let Camcar engineers examine your fasteners and advise what Cold-Flow can do for you.

CAMCAR SCREW & MFG. CORP.
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CAMCAR COLD-FLOW

Handling Steel Bar Stock

Fork truck with homemade crane attachment solves problem of unloading bars

TELESCOPIC crane, designed as an attachment for a fork-lift truck, is used by the Northwest Automatic Products Corp., Minneapolis, as a time and labor-saving method of unloading truckloads of steel and brass bar stock.

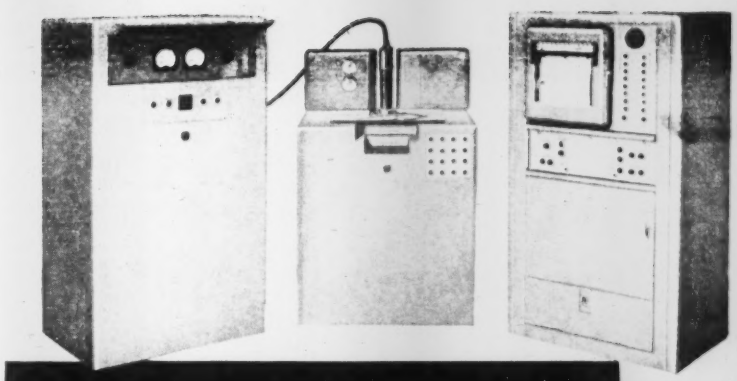
Bar stock is shipped to the firm's screw machine plant tied in bundles from 10 to 16 feet long and weighing 2000 to 10,000 pounds. The heavy, bulky bundles had long been an awkward material handling problem, with manual unloading becoming more and more costly. The problem was solved through use of the crane device designed and built under direction of Northwest's engineering department.

Boom and Hook—Basically, the device is a telescopic boom with a hook at the end. The boom can be extended, like a telescope, to a length of 10 feet by turning a hand crank at the side. Bolted to the mast of a fork-lift truck from which the forks have been removed, the boom can be raised and lowered at will. Another hook at the base of the boom is used to carry loads too heavy for the end hook. A gas-powered Clark Utilitruc of 10,000-pound capacity is the fork-truck used.

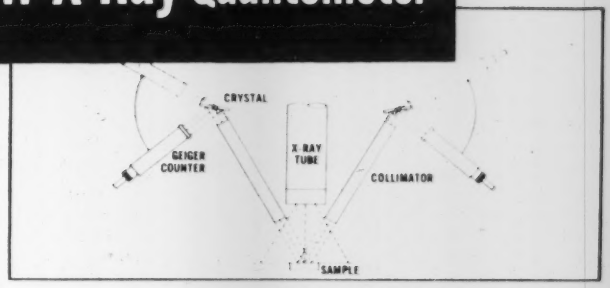
When unloading bundles of bar stock from an open-sided truck, the fork-truck approaches the truck from the rear and maneuvers the boom directly over a bundle. A wire rope sling is suspended from the hook and wrapped around the middle of the bundle. When all is secure, the boom is raised and the bundle is lifted over the side and trucked to storage.

Truck-trailers with roofs do not allow enough room for the boom to move directly over the bundles, so in these cases the sling is wrapped around one end of the bundle and the bundle is dragged half way off the truck. Then the sling is removed and rewrapped around the middle of the bundle and the load is carried away.

Too Many Hands—Inside the



FIRST PCQ, THEN IRQ, NOW XRQ...
the NEW X-Ray Quantometer



Materials analysis by X-Ray fluorescence is the newest industrial tool. The new ARL X-Ray Quantometer* gives you a fast, accurate, non-destructive technique for quantitative determinations of elements present in materials regardless if they are free or in combination. This multichannel unit can be supplied with interchangeable dispersive and non-dispersive analyzers in any combination. As many as eight channels can be used simultaneously . . . giving EIGHT TIMES the analytical speed previously obtainable! *The results are graphed for you automatically in multiple to provide a permanent record.*

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NEW CARBOLOY

CEMENTED CARBIDE

Increases production up to 30% on heavy-duty steel-cutting jobs

New Grade 370 Carboloy cemented carbide cuts more cubic inches of steel per minute — with longer tool life — than any existing carbide. The first of the new Series 300 cemented carbides, Grade 370 was specially developed for taking heavier cuts in steel at higher speeds than ever before practical.

BUILT-IN TIP RIGIDITY

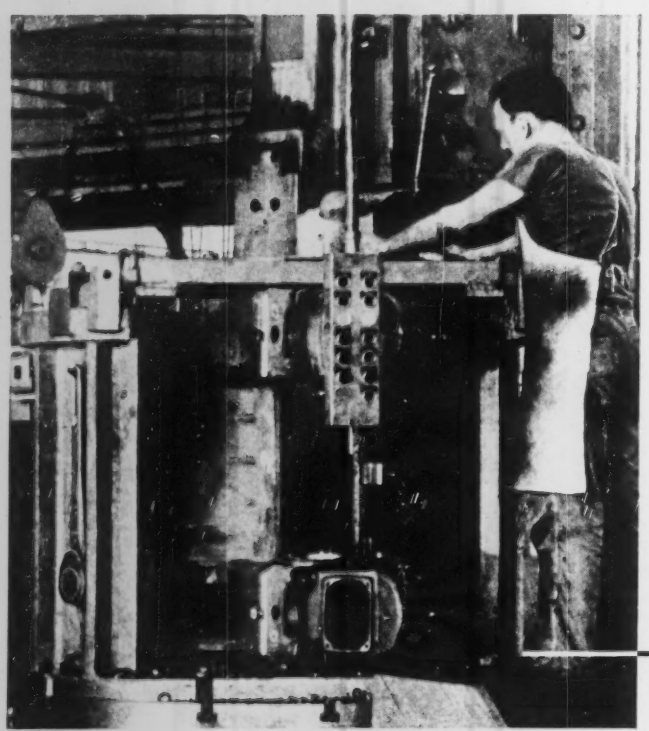
Heavy-duty, high-speed machining builds up great pressures and high temperatures which cause other tools to fail because their cutting edges deform. Grade 370 is made from start to finish by a new, carefully controlled manufacturing process which gives it a built-in structural rigidity to resist this deformation — even at temperatures of around 1800° F.

PROVED PERFORMANCE

Grade 370 has already been proved, both in Carboloy laboratories, and on tough on-the-job customer applications such as rolls, gun barrels, locomotive wheels and other heavy-duty operations. It successfully withstands higher temperatures and pressures of heavy cuts at higher speeds, and lasts longer — longer than any existing carbide. *Production goes up as much as 30%.*

AVAILABLE NOW

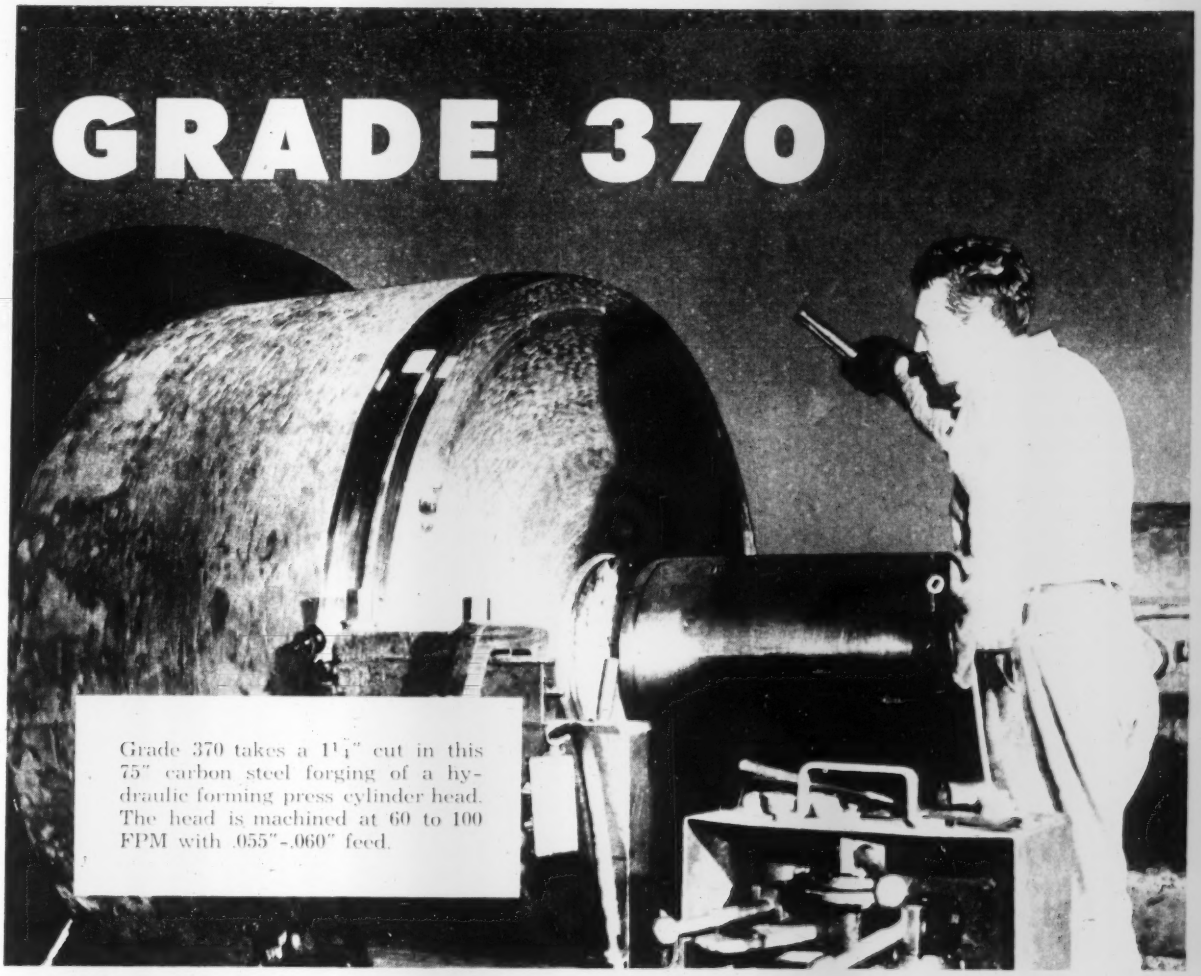
Grade 370 is available immediately in a number of sizes and shapes. Send coupon today for additional information and for free technical literature. The Carboloy Engineering Appraisal Service will work with you on specific applications.



Close-up of cylinder head forging. Grade 370 cuts large chips and withstands the tremendous pressure and temperature without deforming. With Grade 370, both machine downtime and tool cost per cubic inch of steel removed were substantially reduced.

Vertical mill taking ¼" to ¾" cut in an alloy steel casting for a traction motor frame. Grade 370 machined 70 FPM with .050" feed . . . and resulted in a reduction of tool costs of approximately 10 to 1 over other carbides.

GRADE 370



Grade 370 takes a $1\frac{1}{4}$" cut in this 75" carbon steel forging of a hydraulic forming press cylinder head. The head is machined at 60 to 100 FPM with .055"-.060" feed.

CARBOLOY

DEPARTMENT OF GENERAL ELECTRIC COMPANY

"Carboloy" is the trademark for the products of the Carboloy Department of General Electric Company

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Department of General Electric Company
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Gentlemen: Rush me, at no cost or obligation, all facts now available on your new Grade 370 Carboloy cemented carbide.

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Company

Position

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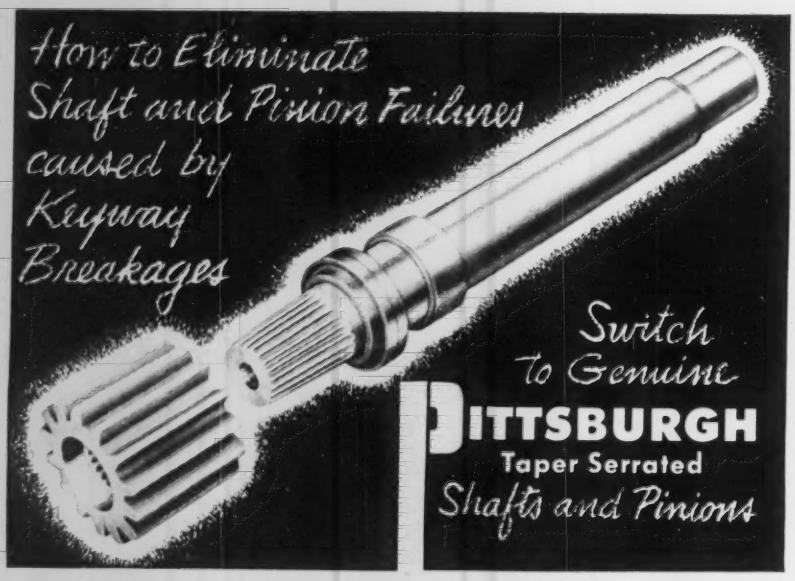

33⅓% Increase in Life of Shafts and Pinions

Keyways weaken both shaft and pinion and frequently cause failures and work stoppages. But this can be eliminated by using PITTSBURGH Taper Serrated Shafts and Pinions which provide an all-around **V-lock** for great strength and endurance.

The male serrations on the shaft lock perfectly in the female serrations of the pinion. There is just enough taper so the pinion can be easily "shocked" on or off the shaft. One user reports no failure on more than 75 PITTSBURGH Taper Serrated Shafts and Pinions installed during a 4½ year period.

Genuine PITTSBURGH Taper Serrated Shafts and Pinions are available in many standard sizes, or made to your requirements.

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subsidiary of BRAD FOOTE GEAR WORKS, INC. • CICERO 50, ILLINOIS

plant, bundles are stored on horizontal racks set at a 45-degree angle to facilitate maneuvering by the truck. As the bar stock is needed in the machine shop, the crane either lifts or drags bundles off the racks onto steel-stock trucks for delivery.

Before the crane attachment was devised bundles were unloaded and stacked manually. Bundles were untied as they lay on the truck and each man carried one or two bars to the racks. Cost in manhours decided Northwest to acquire a crane for the unloading work. Rather than buy an elaborate unit, the engineering department designed this low-cost crane to do the job.

Standard Fork Too — With the crane built at a cost of approximately $1000, two or three men can unload and store an average shipment of bar stock in less than one hour. When the crane attachment is not needed, it can be removed and replaced with standard forks so that the fork truck can be used for other purposes.

Insert Saves Operation

Inexpensive insert on power brake dies allows an average saving of more than $1 per part at Temco Aircraft Corp., Dallas.

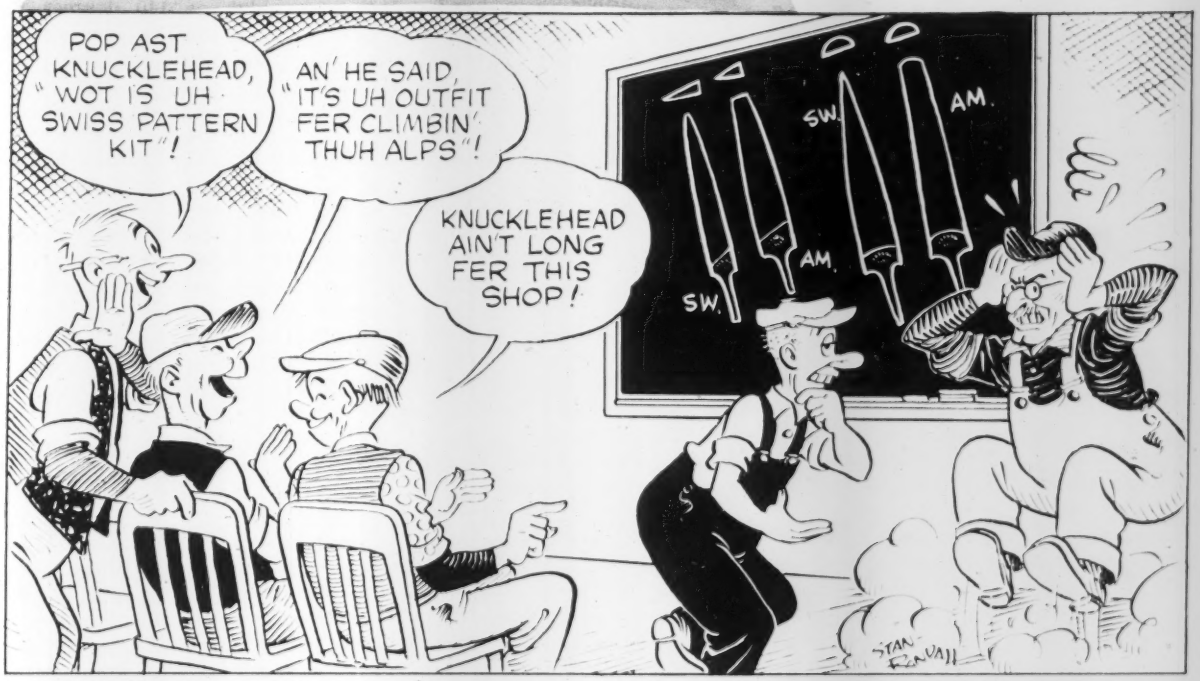
Savings result from elimination of much hand forming that normally followed forming on the power brake machines. Rejections, too, are reduced by the insert.

This insert is fabricated of 1/16 or ⅛-inch scrap steel and designed for use when parts with large holes, cutouts, or scarfs are being formed. Normally, power brake pressure will cause a part to flare, if a hole, cutout, or scarf is located where the bend is made.

Flare is an increase in the radius of a bend. It occurs because these areas receive less support from bottom dies and, therefore, are less sensitive to top, or radius, die pressure.

Insert fits part as it lies across jaws of the bottom die. It is bent to the same radius as the outside of the part that is being formed. Part lies on top of, and is supported by, the insert. This support—around cutout and scarfed edges—equalizes top die pressure allowing uniform bend.

POP'S school of filing



Precision work is the main purpose of Swiss Pattern files, and their uses have been expanding year after year. Tool, die and model finishing, instrument assembling, slot rounding and bur removals from drilling and machining operations are among their widest fields.

Nicholson is considered today's foremost manufacturer of such files. Shapes, cuts and sizes are almost legion. Measurements are more exacting than in American patterns. Points are smaller; tapers are longer.

Because of their extra *fine* quality and workmanship, Nicholson Swiss Patterns are appropriately trademarked X.F. They are the handicraft of specially trained file cutters working in a separate section of the Nicholson factory.

ASK YOUR INDUSTRIAL DISTRIBUTOR

for any of these NICHOLSON X.F. Swiss Pattern file types or groups: Round and Square Handle Needle files (in plastic-box kits of 12 assorted shapes and choice of 3 lengths and 4 cuts); Die Sinkers files; Die Sinkers and Silversmiths Rifflers; Filing Machine files. Individual Crochet, Barrette, Slitting, Crossing, Pippin, Joint, Screw Head, Warding, Equaling, Corrugating, Pillar Testing, Round, Flat, Square, Three Square, Knife —and many others.

X.F. TRADE MARK

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NICHOLSON ... A FILE FOR EVERY PURPOSE

HOW KRANE KAR SWING-BOOM CRANE SAVES M-H* DOLLARS

A MACHINERY MFR. reports, "KRANE KAR has cut our Materials-Handling costs on the average about 75%."

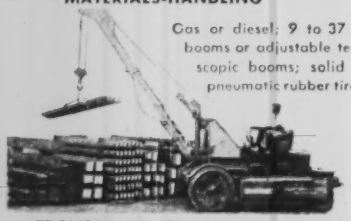
A FORGING PRODUCER writes, "Up to a quarter-million pounds of steel moved in an 8-hour day."

"KRANE KAR," a BALL BEARING MFR. says, "unloaded 50 tons of tubing from a box-car and transferred same to truck in 3 hours."

Another MANUFACTURER: "Simplified our materials-handling . . . saved us $3824.24 in 8 months."

ADDITIONAL CASE HISTORIES IN ILLUSTRATED BUL. #89

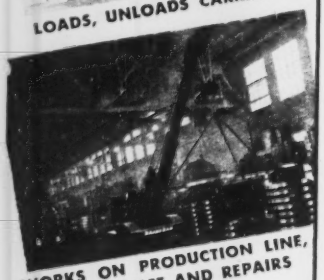
*MATERIALS-HANDLING



Gas or diesel; 9 to 37 ft. booms or adjustable telescopic booms; solid or pneumatic rubber tires.

TRANSPORTS, STACKS, STORES

LOADS, UNLOADS CARRIERS



WORKS ON PRODUCTION LINE, MAINTENANCE AND REPAIRS

MOVES SCRAP, WASTE MATERIAL

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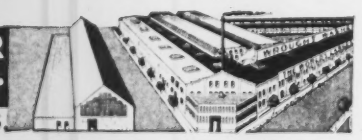
WASHERS STAMPINGS

WROUGHT WASHER MANUFACTURING CO.
The World's Largest Producer of Washers
2103 S. BAY ST., MILWAUKEE 7, WIS.



A 7511-3⅛

Air Conditions Pulpit

New units are of split-type design. Condensing units are either air or water cooled

AIR CONDITIONING equipment, for use where ambient temperatures as high as 140 degrees F are encountered is announced by Dravo Corp., Pittsburgh. They are of split-type design with the evaporator (single or multiple) being installed within the air conditioned space and the condensing section outside. Equipment is engineered for steel mill pulpits.

Air conditioner was designed and developed to meet the needs of such applications with single or multiple sets of either 2 or 3-ton capacity evaporators. These are available in floor and ceiling mounted styles, and when multiple units are installed they are connected to a single condensing unit.

Air Switch—Ample fresh make-up air is brought into the evaporator section to furnish adequate ventilation for the number of persons present. Circulating air is mixture of 25 per cent make-up and 75 per cent return air.

Both air and water cooled condensing units are available in 2, 3, 5 and 7½-ton sizes to provide for the most economical method of installation and operation, depending upon whether or not water is already available at the pulpit. The 5 and 7½-ton sizes are required where multiple evaporator sections are used.

Air cooled condensing unit consists of a large condensing coil with its individual fan and motor; the compressor being separately driven. Water cooled condenser consists of a compressor, compressor motor and a double-tube condenser. Water passes through the inner tube and the refrigerant (Freon 12) flows through the outer tube. All component parts of the condensing units are mounted on structural all-welded steel frames.

Units are designed to maintain 80 to 85 F within a pulpit when ambient temperatures reach as high as 140 F. Electric strip heaters are provided with sufficient capacity to maintain the circulating air temperature at 68 to 72 F in the winter.

Millions of tons of boron steels prove the efficiency and economy of Vancoram

GRAINAL ALLOYS

Vancoram GRAINAL Alloys have been used to produce millions of tons of boron steels—and demand for these multiple element alloys is still growing. Here's why . . .

GRAINAL Alloys have proved invaluable in defense production, and are equally important in the making of steels for peacetime uses. They replace costly elements with respect to hardenability and other properties. They accomplish this through tailor-made composition that removes the element of chance from the steelmaking process. That's why the vast majority of all boron steels made today are made with GRAINAL Alloys.

Second, in stainless steels, small additions of GRAINAL Alloys improve hot working characteristics, cut conditioning costs, increase output—pointing the way to another major GRAINAL application.

As part of its long-range program for keeping in step with America's expanding metals industries, Vanadium Corporation has installed at its new plant at Cambridge, Ohio, additional facilities for the production of GRAINAL Alloys.

For complete information on GRAINAL Alloys and other Vancoram products, contact your nearest Vanadium Corporation representative.

Write today for this new booklet on economical GRAINAL *Alloys and their application.*

Producers of alloys, metals and chemicals

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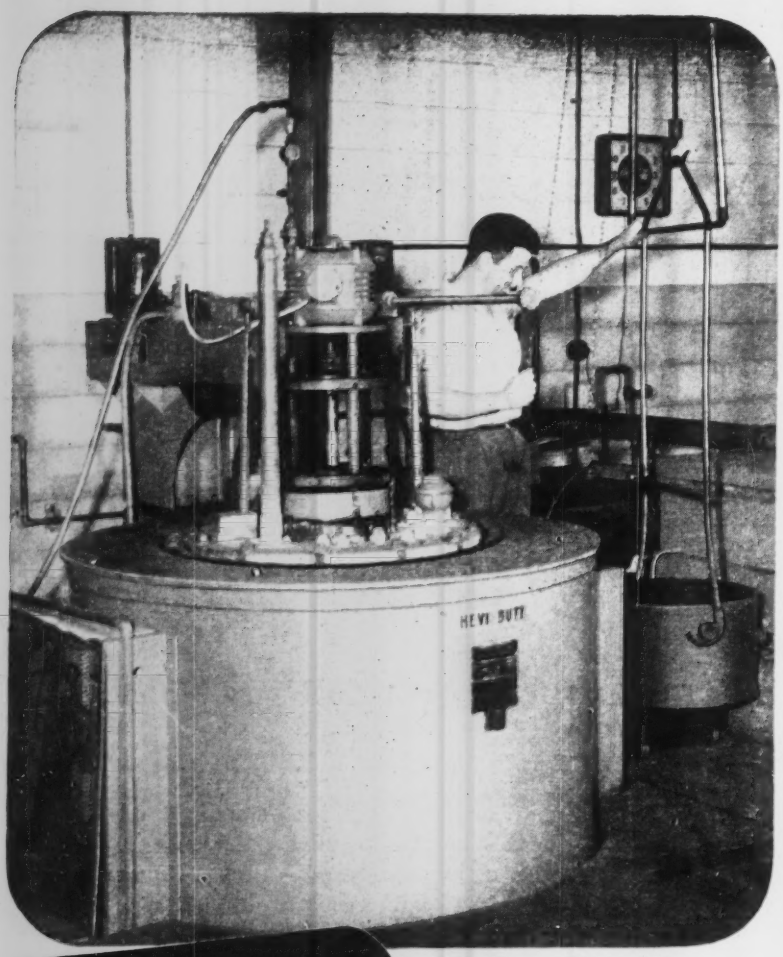

"Exceptionally Versatile" . . . that's why Pesco bought HEVI DUTY FURNACES

"We use our rugged Hevi Duty furnaces for carburizing, nitriding, hardening and normalizing parts for jet engine pumps," says Russ Fike chief metallurgist of the Pesco Products Co. "We can carburize one load and nitride the next by simply changing the atmosphere. Operating costs are at a minimum due to low ammonia consumption when nitriding, and our maintenance costs are negligible."

Learn how the versatile Hevi Duty vertical retort furnace can solve your production problems, write for your copy of bulletin HD-646 today.

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Heat Treating Furnaces . . . Electric Exclusively

Dry Type Transformers *Constant Current Regulators*

Plastic Subs for Stainless

Shortage of Type 316 stainless flexible steel hose eased by neoprene-cotton tubing

FLEXIBLE TUBING of neoprene-coated cotton duck, supported by a wire helix, is replacing flexible stainless steel hose for handling corrosive vapors at a large Eastern copper refinery.

Application is fume removal from electrolytic copper refining tanks. Tanks are covered by removable stainless steel hoods, from which connections are made to a fixed fume removal system, to draw off the H_2SO_4 vapors which are formed.

Shift Hoods—When a tank is taken out of service for removal of the copper, its hood may be shifted to another tank which is ready to go back into service. Thus hoods must fit all tanks. To take care of minor variations in dimensions, connections between hoods and the permanent fume removal ducts are made with flexible duct.

Because of the extreme corrosiveness of the fumes, Type 316 stainless steel is used for hoods and ducts. In heavy gages, it withstands the acid attack for long periods. Formerly, Type 316 flexible articulated metal hose was also used for the flexible connections. But because of the high military demand for nickel-bearing alloys, Type 316 flexible hose has not been readily available. Other types of stainless steel hose were easier to obtain, but in the thin gages necessary to retain flexibility, they didn't last long.

Shift to Plastic—It was decided to turn to Spiratube R, made by Flexible Tubing Corporation, Guilford, Conn. This is a lightweight, highly flexible tubing made of neoprene-impregnated cotton duck, spirally wound on a wire helix.

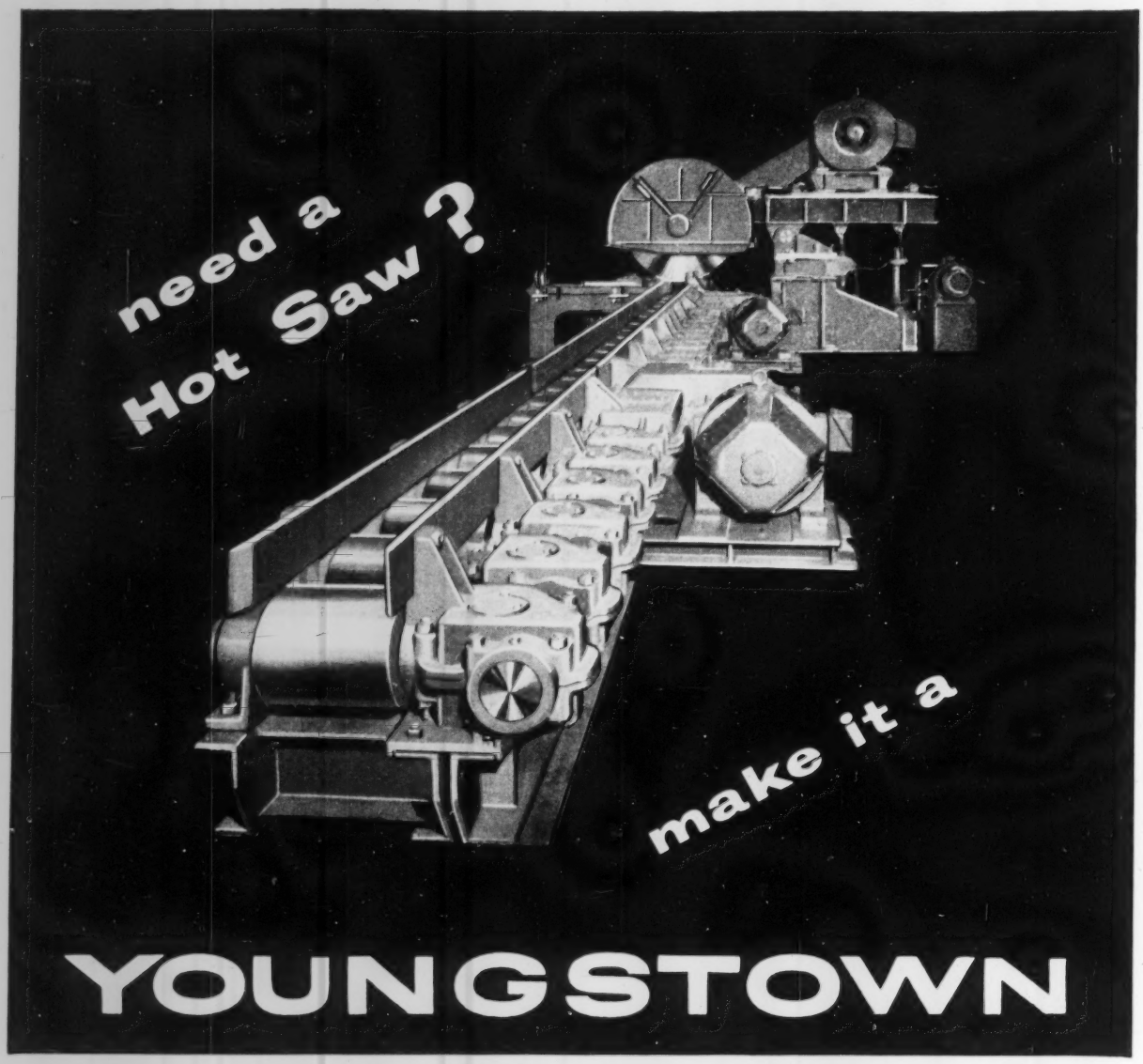
Heavy coating of neoprene makes the tubing highly resistant to attack by the acid fumes. Its flexibility, and the abrasion resistance of its coating enables it to give long service despite the frequent making and breaking of joints. Small breaks in the Spiratube wall can be repaired by operating personnel with a patching kit. Formerly, metal hose had to be removed to the maintenance shop for repair by welding.

STAINLESS STEEL FOR BUILDINGS

McLouth STAINLESS Steel

For the product you make today and the product you plan for tomorrow.

McLOUTH STEEL CORPORATION
DETROIT, MICHIGAN
Manufacturers of Stainless and Carbon Steels



F&M

ROCKER AND SLIDE TYPES
FOR CUTTING

BILLETS • RAILS
ROUNDS • TUBING
SQUARES • STRUCTURALS
SPECIAL SHAPES

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

STEEL

December 7, 1953

Market Outlook

STEEL demand and production are headed downward, but getting under way in the steel industry is a study of the needs for another cycle of expansion of steel producing capacity—for 1960 and beyond.

One cycle of steel capacity expansion is being completed this year. But the U. S. population continues to increase by leaps and bounds, and the record-breaking steelmaking capacity could be inadequate ere long.

MORE CUSTOMERS—Not only is the population increasing, but in the mid 1960s the number of family formations will surge upward when the persons born during the big wave of births right after World War II become of marriageable age. Family formations are a highly important factor in steel demand. When a family is formed there is created immediately a need for all sorts of steel products for its home, its yard and perhaps a garden. As children come along, there's need for metal toys and additional furniture that utilize steel. Perhaps an extra automobile is needed for the growing family.

SLOW DOWN—Right now, the number of family formations is declining because people coming of marriageable age were born during the depression of the 1930s, and the birth rate shrunk during that period. So, while the need for steel probably will go up during the next few years merely because the population is increasing, it will not climb as rapidly as it should in the mid 1960s when family formations are rising sharply.

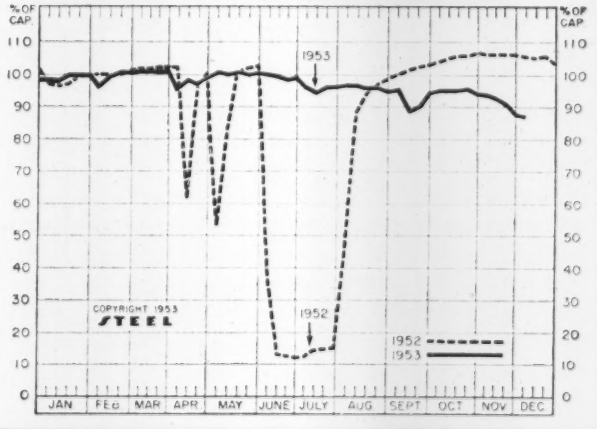
TARGET: 1960s—The reason the new study of capacity has sights set on 1960 and beyond is that in 1960 we should have a preview of the expansion in family formations. The birth rate climbed during 1940, 1941, 1942 and 1943, before dropping in 1944 and 1945, and surging upward from then on. Persons born in those first four years will start attaining marriageable age about 1960.

The study of the next cycle of steel expansion is so new that it hasn't reached top management. The study is centered largely in market research departments. Before management can decide on plans and policies it must have a complete analysis of the needs.

CRYSTAL GAZING— The researchers are looking at what steel ingot capacity will be required, what finishing capacity will be needed and where the various capacities should be located.

MEASURING THE NEEDS—The continued increase in population is almost sure to require an expansion of steel ingot capacity. We now have about 120 million net tons of such capacity. On the basis of our present population of 160,288,000 there's an ingot capacity of 1495 pounds per capita. However, at least 5 million tons of this capacity, and perhaps as much as 10 million, represent marginal, high-cost facilities which can be operated only in time of peak demand. If you drop off 10 million tons, there's a per capita capacity of only 1375 pounds. Consider that the 1960 census is expected to be 175 million and you'd find there would be an ingot capacity of only 1255 pounds per capita if there were no further expansion. A drop in per capita capacity would be illogical, for our standard of living is going up, and a rising standard of living requires an increasing amount of metal.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of capacity engaged at leading production points)

	Week Ended Dec. 5	Change	Same Week 1952	Same Week 1951
Pittsburgh	78.5	+ 1.5*	103	100
Chicago	96	— 0.5*	108.5	107.5
Mid-Atlantic	90	0	101	101.5
Youngstown	90	— 3	106	106
Wheeling	91	+ 13	100.5	99.5
Cleveland	93	— 5*	108	106
Buffalo	100	+ 0.5	106.5	104
Birmingham	96.5	0	106.5	104
New England	77	— 8	92	92
Cincinnati	71.5	+ 4	93	102
St. Louis	84.5	+ 13.5	99	93.5
Detroit	101	— 3.5	106	106
Western	90	— 3	107	105
Estimated National Rate	87	— 0.5	105.5	103.5

*Change from preceding week's revised rate

Weekly steelmaking capacity is estimated at 2,254,436 net tons in 1953; 2,077,040 tons in 1952; 1,999,034 tons in 1951.

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PRICE INDEXES AND COMPOSITES

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics) Week Ended Dec. 1

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, standard, No. 1	$4.100	Bars, H.R., stainless, 303 (lb)		Strip, C.R., stainless, 430 (lb)	$0.415	Tin plate, hot-dipped, 1.25 lb	$8.433
Rails, light, 40 lb	5.767	Bars, H.R., alloy	$8.675	Strip, H.R., carbon	5.013	Tin plate, electrolytic, 0.25 lb	7.133
Tie Plates	4.125	(lb)	0.418	Pipe, black, buttweld (100 ft)	14.454	Black plate, can making quality	6.233
Axles, railway	7.250	Bars, H.R., carbon	4.850	Pipe, galv., buttweld (100 ft)	17.731	Wire, drawn, carbon	7.713
Wheels, freight car, 33 in. (per wheel)	47.000	Bars, reinforcing	4.775	Pipe, line (100 ft)	141.960	Wire, drawn, stainless, 430 (lb)	0.545
Plates, carbon	4.550	Bars, C.F., carbon	7.860	Casing, oil well, carbon (100 ft)	149.516	Bale ties (bundle)	5.653
Structural Shapes	4.265	Bars, C.F., alloy	11.075	Casing, oil well, alloy (100 ft)	214.113	Nails, wire, 8d common	7.488
Bars, tool steel, carbon (lb)	0.415	Bars, C.F., stainless, 302 (lb)	0.433	Tubes, boiler (100 ft)	‡	Wire, barbed (80-rod spool)	6.847
Bars, tool steel, alloy, oil hardening die (lb)	0.567	Sheets, H.R., carbon	4.765	Tubing, mechanical, carbon (100 ft)	‡	Woven wire fence (20-rod roll)	16.174
Bars, tool steel, H.R. alloy high speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.135	Sheets, C.R., carbon	5.904	Tubing, mechanical, stainless, 304 (100 ft)	161.193		
Bars, tool steel, H.R. alloy high speed W 18, Cr 4, V 1 (lb)	1.730	Sheets, galvanized	6.945				
		Sheets, C.R., stainless, 302 (lb)	0.548				
		Sheets, electrical	9.183				
		Strip, C.R., carbon	7.250				

‡ Not available.

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Dec. 1 1953	Nov. 24 1953	Month Ago	Nov. Average
(1947-1949=100)	141.5	141.5	141.5	141.5

STEEL's FINISHED STEEL PRICE INDEX

	Dec. 3 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	189.74	189.91*	189.91*	181.31	151.86
Index in cents per lb	5.140	5.145*	5.145*	4.912	4.111

*Revised

STEEL's ARITHMETICAL PRICE COMPOSITE*

	Dec. 3 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Finished Steel, NT	$114.95	$115.18	$115.18	$110.98	$95.50
No. 2 Fdry. Pig Iron, GT.	56.54	56.54	56.54	55.04	46.69
Basic Pig Iron, GT	56.04	56.04	56.04	54.66	46.29
Malleable Pig Iron, GT.	57.27	57.27	57.27	55.77	47.41
Steelmaking Scrap, GT	34.33	34.67	35.00	43.00	43.25

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

COMPARISON OF PRICES

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Dec. 3 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.15	4.15	4.15	3.95	3.45
Bars, H.R., Chicago	4.15	4.15	4.15	3.95	3.35
Bars, H.R., del. Philadelphia	5.302	5.302	5.302	4.502	3.79
Bars, C.F., Pittsburgh	5.20	5.20	5.20	4.925	3.95
Shapes, Std., Pittsburgh	4.10	4.10	4.10	3.85	3.275
Shapes, Std., Chicago	4.10	4.10	4.10	3.85	3.25
Shapes, delď., Philadelphia	4.38	4.38	4.38	4.13	3.48
Plates, Pittsburgh	4.10	4.10	4.10	3.90	3.50
Plates, Chicago	4.10	4.10	4.10	3.90	3.40
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.35	3.75
Plates, Sparrows Point, Md.	4.10	4.10	4.10	3.90	3.45
Plates, Claymont, Del.	4.55	4.55	4.55	4.35	3.95
Sheets, H.R., Pittsburgh	3.925	3.925	3.925	3.775	3.275
Sheets, H.R., Chicago	3.925	3.925	3.925	3.775	3.25
Sheets, C.R., Pittsburgh	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Chicago	4.775	4.775	4.775	4.575	4.00
Sheets, C.R., Detroit	4.975	4.975	4.975	4.775	4.20
Sheets, Galv., Pittsburgh	5.275	5.275	5.275	5.075	4.40
Strip, H.R., Pitts.	4.425	4.425	4.425	3.75-4.225	3.275
Strip, H.R., Chicago	3.925	3.925	3.925	3.725	3.25
Strip, C.R., Pittsburgh	5.45	5.45-5.95	5.45-5.95	5.10-5.80	4.375
Strip, C.R., Chicago	5.70	5.70	5.70	5.35	4.00
Strip, C.R., Detroit	5.45-6.05	5.45-6.05	5.45-6.05	5.30-6.05	4.20
Wire, Basic, Pitts.	5.525	5.525	5.525	5.10-5.225	4.325
Nails, Wire, Pittsburgh	6.55	6.55	6.55	6.20-6.85	5.775
Tin plate (1.50 lb), box, Pitts.	$8.95	$8.95	$8.95	$8.95	$6.70

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$75.50	$75.50	$75.50	$70.50	$61.00
Wire rods, ½-⅞", Pitts.	4.525	4.525	4.525	4.425	3.775

PIG IRON, Gross Ton	Dec. 3 1953	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bessemer, Pitts.	$57.00	$57.00	$57.00	$55.50	$47.00
Basic, Valley	56.00	56.00	56.00	54.50	46.00
Basic, delď. Phila.	60.75	60.75	60.75	59.25	50.17
No. 2 Fdry, Pitts.	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, Chicago	56.50	56.50	56.50	55.00	46.25
No. 2 Fdry, Valley	56.50	56.50	56.50	55.00	46.50
No. 2 Fdry, delď. Phila.	61.25	61.25	61.25	59.75	50.67
No. 2 Fdry, Birm.	52.88	52.88	52.88	51.38	43.38
No. 2 Fdry (Birm.) del. Cin.	60.43	60.43	60.43	58.93	49.09
Malleable, Valley	56.50	56.50	56.50	55.00	46.50
Malleable, Chicago	56.50	56.50	56.50	55.00	46.50
Ferromanganese, Duquesne	200.00†	200.00†	200.00†	228.00*	163.00*

*78-82% Mn, per gross ton, Etna, Pa. †74-76% Mn, per net ton.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$34.50	$35.50	$36.50	$44.00	$42.75
No. 1 Heavy Melt, E. Pa.	35.00	35.00	35.00	41.50	45.25
No. 1 Heavy Melt, Chicago	33.50	33.50	33.50	42.50	41.75
No. 1 Heavy Melt, Valley	33.50	34.50	35.50	44.00	42.75
No. 1 Heavy Melt, Cleve.	31.50	32.50	33.50	43.00	42.25
No. 1 Heavy Melt, Buffalo	32.50	34.50	34.50	43.00	48.50
Rails, Rerolling, Chicago	46.00	46.50	45.00	52.50	70.50
No. 1 Cast, Chicago	34.50	34.50	33.50	45.00	70.50

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.75	$14.75	$14.75	$14.75	$14.50
Beehive, Fdry, Connlsvl.	16.75	16.75	16.75	17.00	17.00
Oven, Fdry, Chicago	24.50	24.50	24.50	23.00	20.40

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

PRIMARY METALS AND ALLOYS

Aluminum: 99+%, ingots 21.50, pigs 20.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 23.30; No. 43, 5% Si, 23.10; No. 142, 4% Cu, 24.40; No. 195, 4.5% Cu, 0.8% Si, 23.70; No. 214, 3.8% Mg, 24.40; No. 356, 7% Si, 0.3% Mg, 23.20.

Antimony: R.M.M. brand, 99.5%, 28.50, Lone Star brand, 29.00, f.o.b. Laredo, Texas, in bulk. Foreign brands, 99.5%, 25.50-26.00 New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa.

Beryllium Copper: 3.75-4.25% Be, $10.00 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa. or Elmore, O.

Bismuth: $2.25 per lb, ton lots.

Cadmium: Sticks and bars, $2.00 per lb delď.

Cobalt: 97-99%, $2.60 per lb for 550 lb keg; $2.62 per lb for 100 lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $75.00 per lb, nom.

Copper: Electrolytic 29.50-30.00 delď. Conn. Valley, 29.625-30.125 delď. Midwest; Lake 30.125 delď; Fire refined 29.75 delď.

Germanium: 99.9%, $295 per lb nom.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $165-$175 per troy oz.

Lead: Common 13.30, chemical 13.40, corroding 13.40, St. Louis, New York basis, add 0.20.

Lithium: 98%, $11-$14 per lb, depending on quantity.

Magnesium: 99.8% standard ingots 27.00, 10,000 lb or more, f.o.b. Freeport, Tex. Sticks, 1.3 in. dia., 45.00, 100 to 4999 lb.

Magnesium Alloys: AZ91B 30.50; AZ91C and alloys C, H, G and R 32.50; alloy M 34.50, 10,000 lb or more.

DAILY NONFERROUS PRICE RECORD

	Price Dec. 3	Change	Previous Price	Nov. Avg.	Oct. Avg.	Dec. 1952 Avg.
Copper	29.50-30.00	Oct. 20	29.00-30.00	29.750	29.688	24.500
Lead	13.30	Sept. 16	13.80	13.300	13.300	13.925
Zinc	10.00	Sept. 11	10.50	10.000	10.000	12.500
Tin	83.00	Dec. 3	82.00	83.352	81.096	121.500
Nickel	60.00	Jan. 14	56.50	60.000	60.000	56.500
Aluminum	21.50	July 15	20.50	21.500	21.500	20.000
Magnesium	27.00	Mar. 9	24.50	27.000	27.000	24.500

Quotations in cents per pound based on: Copper, delď. Conn. Valley; Lead, common grade, delď. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, delď. New York; Nickel, electrolytic cathodes, 99.9%, bas. size at refinery unpacked; Aluminum, primary ingots, 99+%, delď.; Magnesium, 99.8%, Freeport, Tex.

Mercury: Open market, spot, New York, $185-$188 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced $3.40 per lb; pressed ingot $4.06 per lb; sintered ingot $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 60.00; 25-lb pigs 62.65; "XX" nickel shot 63.65; "F" nickel shot or ingots for addition to cast iron, 60.00; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $140-$150 per troy oz, nom.

Palladium: $22-$24 per troy oz.

Platinum: $91-$93 per troy oz, from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $125 per troy oz.

Ruthenium: $75-$80 per troy oz.

Selenium: 99.5%, $4.25-$4.75 per lb.

Sodium: 16.50, carlots; 17.00 l.c.l.

Tantalum: Sheet, rod $42.45 per lb; powder $33.50 per lb.

Tellurium: $1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, New York, 83.00.

Titanium: Sponge, 99.3+%, $5 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000 lb lots $5.35 per lb f.o.b. shipping point; less than 1000 lb $5.50; 99+% hydrogen reduced, $6.30. Treated ingots $10.43.

Zinc: Prime western 10.00, brass special 10.25, intermediate 10.50, E. St. Louis, freight allowed over 0.50 per pound. High grade 11.35, special high grade 11.50, die casting alloy ingot 14.50, deld.

Zirconium: Sponge $14.00 per lb; powder 100 lb or more $7.00; less than 100 lb $8.00.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston Alloys 21.00-22.00; No. 12 foundry alloy (No. 2 grade) 20.25-21.25; 5% silicon alloy, 0.60 Cu max., 23.00-24.00; 13 alloy, 0.60 Cu max., 23.00-24.00; 195 alloy 22.00-22.75; 108 alloy 21.00-21.50; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 21.50-22.00; grade 2, 20.50-21.00; grade 3, 1950-20.00; grade 4, 17.50-18.50.

Brass Ingot: Red brass, No. 115, 24.50; tin bronze No. 225, 35.25, No. 245, 29.50; high-leaded tin bronze, No. 305, 28.75; No. 1 yellow, No. 405, 20.75; manganese bronze No. 421, 25.25.

Magnesium Alloy Ingot: AZ63A, 31.50; AZ91B, 31.50; AZ91C, 32.00; AZ92A, 31.50.

NONFERROUS MILL PRODUCTS

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000 lb lots, 35.36; 30,000 lb lots, 35.48; l.c.l. 35.98. Weatherproof, 100,000 lb 36.28; 30,000 lb, 36.53; l.c.l., 37.03. Magnet wire deld., 15,000 lb or more 41.83; l.c.l., 42.58.

LEAD

(Prices to jobbers f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more $18.50 per cwt; pipe, full coils $18.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 100,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forging billets, $6; hot-rolled and forged bars, $6.

ZINC

Sheets 23.00, f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 19.50-20.50, f.o.b. mill, 36,000 lb and over. Plates 19.50-22.25.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheet, C.R.	86.5	67.5	92.5
Strip, C.R.	92.5	70.5	98.5
Plate, H.R.	84.5	66.5	90.5
Rod, Shapes	82.5	65.5	88.5
Seamless Tubes	115.5	100.5	137.5
Shot, Blocks	....	60.0	....

ALUMINUM

(30,000 lb base; freight allowed over 499 lb)
Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Inc.	Flat Sheet*	Coiled Sheet	Coiled Sheet Circlet
0.249-0.136	12-48	33.9	...	...
0.135-0.096	12-48	34.4	...	...
0.095-0.077	12-48	35.1	32.7	37.5
0.076-0.061	12-48	35.7	32.9	37.7
0.060-0.048	12-48	36.1	33.2	38.1
0.047-0.038	12-48	36.6	33.6	38.4
0.037-0.030	12-48	37.0	34.0	39.1
0.029-0.024	12-48	37.6	34.3	39.6
0.023-0.019	12-36	38.3	35.1	40.4
0.018-0.017	12-36	39.1	35.7	41.3
0.016-0.015	12-36	40.0	36.5	42.5
0.014	12-24	41.0	37.5	43.8
0.013-0.012	12-24	42.1	38.2	44.8
0.011	12-24	43.1	39.4	46.4
0.010-0.0095	12-24	44.3	40.5	48.0
0.009-0.0085	12-24	45.6	41.9	50.0
0.008-0.0075	12-24	47.1	43.1	51.8
0.007	12-18	48.6	44.6	54.1
0.006	12-18	50.2	46.0	59.1

* 72-180 in. lengths. † 26 in. max. dia.

ALUMINUM

Plates and Circles: Thickness 0.250-3.0 in., 24-60 in. widths or dia., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
2S-F, 3S-F	32.4	36.3
50S-F	33.5	37.4
4S-F	34.5	39.1
52S-F	36.2	40.9
61S-T6	37.4	41.5
24S-T4*	39.3	45.4
75S-T6*	47.1	53.7

* 24-48 in. widths or dia., 72-180 in. lengths.

ALUMINUM

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or across flats	Round 11S-T3	Round 17S-T4	Hexagonal 11S-T3	Hexagonal 17S-T4
Drawn				
0.125	50.6	57.9	...	...
0.156-0.172	50.6	48.9	...	...
0.188	50.6	48.9	...	62.4
0.219-0.234	47.9	46.2	...	...
0.250-0.281	47.9	46.2	...	59.5
0.313	47.9	46.2	...	56.8
Cold-finished				
0.375-0.531	46.6	44.9	56.2	53.4
0.563-0.688	46.6	44.9	53.4	50.2
0.750-1.000	45.5	43.8	48.9	47.3
1.063	45.5	43.8	...	45.7
1.125-1.500	43.8	42.1	47.3	45.7
Rolled				
1.563	42.7	41.0	...	...
1.625-2.000	42.1	40.4	...	44.1
2.125-2.500	41.1	39.4	...	...
2.750-3.375	39.9	38.2	...	...

ALUMINUM

Forging Stock: Round, Class 1, 42.05-32.76, in specific lengths 36-144 in., diameters 0.375-8 in.; rectangles and squares, Class 1, 49.2 to 37.6 in random lengths 0.375-4.0 in. thick, widths 0.750-10.0 in.

Pipe: A.S.A. Schedule 40, alloy 63S-T6, 20 ft length, plain ends, 90,000 lb base, per 100 ft.

Nom. pipe size, in.		Nom. pipe size, in.	
¼	$15.05	2	$ 46.30
⅜	23.65	4	127.70
1¼	32.00	6	228.50
1½	38.25	8	343.80

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032-in. 108.00, 0.064-in. 81.00, 0.125-in. 71.00, 30,000 lb and over, f.o.b. mill.

Plate: Hot-rolled, AZ31, 53.00, 20,000 lb or more 0.188-1.0 in. thick, widths to 48 in., lengths to 144 in.; raised pattern floor plate, 69.00, 20,000 lb or more, ¼-in. thick, widths 24-48 in., lengths 60-144 in.

Extrusion Stock: AZ31, Rectangles, ¼ x 2 in. 69.20, 1 x 4 in. 63.00, Rod, 1 in. 66.00, 2 in. 62.50. Tubing, 1 in. OD x 0.065-in. 87.00, Angles, 1 x 1 x ⅛-in. 72.90, 2 x 2 x ⅛-in. 67.00. Channels, 5 in. 67.80, I-Beams, 5 in. 66.20.

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.38b	45.98c	....	48.44	26.000	26.000	25.250
Yellow brass	41.72	41.66	42.26	44.63	19.750	19.500	18.000
Red Brass, 85%	45.44	45.38	45.98	48.25	23.000	22.750	22.250
Low Brass, 80%	44.47	44.41	45.01	47.28	22.125	21.875	21.375
Naval Brass	45.76	46.07	52.80	48.92	18.250	18.000	17.500
Commercial Bronze, 90%	46.95	46.89	47.49	49.51	23.875	23.625	23.125
Nickel Silver, 10%	55.36	59.43g	57.69	....	23.625	23.375	11.813
Phosphor Bronze, A, 5%	66.58	67.08	67.08	68.23	26.125	25.875	24.875
Silicon Bronze	52.71	51.90	52.75	70.11e	25.125	24.875	24.125
Manganese Bronze	49.48	43.62	54.06	....	18.250	18.000	17.500
Muntz Metal	43.96	39.77	....	....	18.625	18.375	17.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 pounds, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded.

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 2S clipping 13.00; low copper clippings 13.00; mixed clippings 10.00; old sheet 10.00; borings and turnings 6.50-7.00; pistons and struts 7.00; crankcases 10.00; industrial castings 10.00.

Copper and Brass: Heavy copper and wire, No. 1 24.00; No. 2 copper 22.00; light copper 19.50-20.00; No. 1 composition red brass 17.50; No. 1 composition turnings 17.00; mixed brass turnings 14.00; new brass clippings 18.00; No. 1 brass rod turnings 13.00; light brass 10.50; heavy yellow brass 13.00; new brass rod ends 15.00; auto radiators, unsweated 13.00; cocks and faucets 15.00; brass pipe 16.50.

Lead: Heavy 10.50; battery plate 5.50-5.75; linotype and stereotype 12.50, electrotype 11.00; mixed babbitt 12.00-12.50.

Magnesium: Clippings 20.00-21.00; clean castings 19.00-20.00; iron castings, not over 10% removable Fe, 18.00-19.00.

Monel: Clippings 24.00-26.00; old sheet 22.00-24.00; turnings 18.00-20.00; rods 24.00-26.00.

Nickel: Sheets and clips 70.00; rolled-anodes 70.00; turnings 40.00; rod ends 70.00.

Tin: No. 1 pewter 40.00-45.00; block tin pipe 65.00-67.00; No. 1 babbitt 37.00-38.00.

Zinc: Old zinc, 3.50; new die cast scrap, 3.50; old die cast scrap, 3.25.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 2S 3S clippings 15.00-16.00; 51S, 52S clippings 15.00-16.00; 14S, 17S, 24S, clippings 14.00-15.00; mixed clippings 14.00-14.75; old sheet 12.50-13.50; old cast 12.50-13.50; clean old cable, free of steel 15.00-16.00; borings and turnings 12.50-13.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 42.00; light scrap 37.00.

Copper, Brass: No. 1 copper 25.00; No. 2 copper 23.00; light copper 21.50; refinery brass (60% copper) per dry copper content 19.50; auto radiators 13.25 nom.

INGOT MAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper, Brass: No. 1 copper 25.00; No. 2 copper 23.50; light copper 22.00; No. 1 composition borings 17.00-18.00; No. 1 composition solids 17.50-18.50; heavy yellow brass solids 13.50-14.00; yellow brass turnings 12.50-12.75; radiators 13.50-14.00.

PLATING MATERIALS

(F.o.b. shipping points, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes $2.15 per lb.

Copper: Flat-rolled 45.04, oval 44.54, 2000-5000 lb; electrodeposited 39.78, cast 42.04, 5000-10,000 lb lots.

Nickel: Depolarized, less than 500 lb 92.00; 500-4999 lb 88.00; over 5000 lb 86.00.

Tin: Bar or slab, less than 200 lb $1.015; 200-199 lb $1, 500-999 lb 99.5; 1000 lb or more 99.

Zinc: Bar 18.50, bar or flat top 17.50, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100 lb drums.

Chromic Acid: Less than 2000 lb 29.00; over 2000 lb 28.75.

Copper Cyanide: Under 1000 lb 63.90, 1000 lb and over 61.90.

Copper Sulphate: 100-6000 lb 11.35; 6000-12,000 lb 11.10; 12,000-24,000 lb 10.85; 24,000-36,000 lb 10.60; 36,000 lb and over 10.35.

Nickel Chloride: 100 lb 45.00; 200 lb 43.00; 300 lb 42.00; 400-4900 lb 40.00; 5000-9900 lb 38.00; 10,000 lb and over 37.00.

Nickel Sulphate: 100 lb 37.00; 200 lb 35.00; 300 lb 34.00; 400-4900 lb 32.00; 5000-15,000 lb 30.00; 36,000 lb and over 29.00.

Silver Cyanide: Cents per ounce, 16 oz 80.625; 100 oz 78.50; 2500 oz and over 77.375.

Sodium Cyanide: Egg, under 1000 lb 19.80, 1000-19,900 lb 18.80, 20,000 lb and over 17.80; granular, add 1.0 premium to above.

Sodium Stannate: Less than 100 lb 65.7; 100-600 lb 61.5; 700-1900 lb 59.1; 2000-9000 lb 57.6; 10,000 lb or more 56.5.

Stannous Chloride (Anhydrous): Less than 50 lb $1.562; 50 lb $1.162; 100-500 lb $1.012; 600-900 lb 98.8; 1000-1900 lb 96.4; 2000-4900 lb 92.7; 5000-19,000 lb 86.6; 20,000 lb and over 80.5.

Stannous Sulphate: Less than 50 lb $1.206; 50 lb 90.6; 100-1900 lb 88.6; 2000 lb and over 86.6.

Zinc Cyanide: Under 1000 lb 54.30, 1000 lb and over 52.30.

Nonferrous Metals

Watch for price reductions in copper and brass mill products, copper wire, brass and bronze ingots and nearly all grades of copper-bearing and tin-bearing scrap

MORE SHAKEDOWNS loom in nonferrous prices.

They're under way now in tin and coming in the next month or so in copper. Stemming from changes in these basic metals, drops can be expected in copper and brass mill products, copper wire, brass and bronze ingots, and nearly all grades of copper-bearing and tin-bearing scrap.

Too Much Tin—The tin debacle came about with government disclosure that it has overbought tin for stockpile by 15-20 per cent. This surplus, expected to amount to about 40,000 tons by next March, may be offered for sale to industry next year through RFC or another government agency.

The announcement, made in Geneva where the International Tin Conference is studying means of stabilizing production and prices of tin, hit the industry like a bombshell. Spot tin prices in New York fell 5 cents in two days, sharpest drop in months.

Mounting Woes—The stockpile has served as a big sponge in absorbing surplus tin produced in the last six years, ranging from 19,000 to 48,000 long tons yearly. To date in 1953, world mine production exceeds consumption by 39,200 tons. The U. S. has another year to go on a three-year contract with Indonesia for about 20,000 tons of tin, though price for next year is subject to negotiation. About 21,000 long tons of tin concentrates have been bought from Bolivia in the last 14 months to strengthen that country's economy.

Excess stocks in RFC's hands next March amount to over a half-year supply for American industry at current consumption rates. Unless stockpile needs are revised upwards or a similar means found to keep the metal from entering or overhanging the market, tin producers' woes are only beginning.

Copper Talks—Operations have resumed at two big Anaconda mines in Chile after six weeks of idleness. Workers agreed to return for a month while negotiators thrashed out an agreement. This is hailed by market men as a sign that the stalemate over sale of Chilean copper to the U. S. will be broken in that time, most likely with higher wages granted workers and a more reasonable exchange rate granted producers. The two mines resuming work account for nearly 20,000 tons of copper monthly.

STEEL's Metal Price Averages for Nov., 1953

(Cents per pound)

Electrolytic Copper, del. Conn.	29.750
Lead, St. Louis	13.300
Prime Western Zinc, E. St. Louis	10.000
Straits Tin, New York	83.352
Primary Aluminum Ingots, del.	21.500
Magnesium	27.000
Nickel, f.o.b. refinery	60.000

Chile's senate has already voted on a copper pact, reportedly in the affirmative. If so, only passage through diplomatic channels and mechanical details need be worked out. One deal already announced is that West Germany will buy 16,000 tons of copper from small and medium Chilean mines at 30 cents, which indicates the U. S. bid price is right.

Aftermath—When the red metal from Chile starts competing with the 10,000 tons monthly sold here by Rhodesia and over 2000 tons monthly offered by the Belgian Congo, time will inevitably bring lower prices as there isn't enough demand here for all that metal at once.

Already dealers are selling January copper below 29 cents, and most market men believe 27 cents a fair near-term estimate of copper's level. Old-timers recall the rule of thumb that copper's historical price can be determined by adding the price of lead and zinc. Lead currently sells for 13.50 cents and zinc for 9.50 cents, which would place copper at 23 cents a pound under that theory.

When copper goes down, all the metals and alloys made of it will follow. Scrap will be less highly prized and the secondary market will lose strength. Some fabricators of copper and its alloys believe lower prices will provide a much-needed shot in the arm for their sluggish operations today.

Union Suggests a Remedy

Declaring an "economic crisis in the nonferrous metals industry" has spread from lead and zinc to threaten copper and brass, Union of Mine, Mill and Smelter Workers recommended a four-point program to counter the danger: Direct federal assistance to workers with accompanying higher wages and reduced taxes, large-scale public works programs to consume "gigantic amounts of lead, zinc, copper and other metals," immediate steps to increase foreign consumption of metals and goods containing metals, and passage of premium price plan legislation to relieve small and marginal mines.

Antimony Price Tumbles

Long-jeopardized antimony price (STEEL, Nov. 16, p. 172) has finally tumbled, its first move in nearly 13 months. National Lead Co. reduced quotations for R.M.M. brand 6 cents to 28.50 cents a pound for bulk quantities f.o.b. Laredo, Tex. Its Lone Star brand is quoted at 29.00 cents for the bulk lots and at 29.50 cents in cases. Last price change was a drop of 4.50 cents, Nov. 3, 1952. The ceiling price under OPS was 50 cents.

Helping Europe Buy Metals

Foreign Operations Administration has been unusually active of late in authorizing spending for metals by European countries in early 1954. Spain has been granted U. S. financing to buy $2 million in copper, aluminum, tin plate and steel strip. France has authorization to buy $1-million in copper products from Canada, and Italy gets $3 million to buy copper and copper products from Latin America.

Nonferrous Briefs

- General Services Administration guaranteed Howe Sound Co. 31.5 cents a pound for delivery before 1956 of 9350 tons of copper from its high-cost Holden mine in Washington.
- A $5.5-million expansion of fabricating facilities for aluminum and copper alloys is underway at the East Alton, Ill., plant of Olin Industries Inc.

SLAB ZINC

every grade of ZINC
for urgent military and
civilian requirements

PRIME WESTERN

SELECT

BRASS SPECIAL

INTERMEDIATE

HIGH GRADE

SPECIAL HIGH GRADE

AMERICAN ZINC SALES COMPANY

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STEEL PRICES

Mill prices as reported to STEEL, cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicate producing company, key on page 213. Key to footnotes, page 245.

—SEMIFINISHED—

INGOTS, Carbon Forging (NT)

Fontana,Calif. K1 ... $56 00
Munhall,Pa. U5 ... 56 00

INGOTS, Alloy (NT)

Detroit R7 ... $63 00
Fontana,Calif. K1 ... 88 00
Midland,Pa. C18 ... 62 00
Munhall,Pa. U5 ... 62 00

BILLETS, BLOOMS & SLABS Carbon Rerolling (NT)

Aliquippa,Pa. J5 ... $62 00
Bessemer,Pa. U5 ... 62 00
Clairton,Pa. U5 ... 62 00
Ensley,Ala. T2 ... 62 00
Fairfield,Ala. T2 ... 62 00
Fontana,Calif. K1 ... 70 00
Gary,Ind. U5 ... 62 00
Johnstown,Pa. B2 ... 62 00
Lackawanna,N.Y. B2 ... 62 00
Munhall,Pa. U5 ... 62 00
So.Chicago,Ill. U5 ... 62 00
So.Duquesne,Pa. U5 ... 62 00

Carbon, Forging (NT)

Aliquippa,Pa. J5 ... $75 50
Bessemer,Pa. U5 ... 75 50
Buffalo R2 ... 75 50
Canton,O. R2 ... 75 50
Clairton,Pa. U5 ... 75 50
Cleveland R2 ... 75 50
Conshohocken,Pa. A3 ... 82 50
Detroit R7 ... 78 50
Ensley,Ala. T2 ... 75 50
Fairfield,Ala. T2 ... 75 50
Fontana,Calif. K1 ... 83 50
Gary,Ind. U5 ... 75 50
Geneva,Utah C11 ... 75 50
Houston S5 ... 86 50
Johnstown,Pa. B2 ... 75 50
Lackawanna,N.Y. B2 ... 75 50
LosAngeles B3 ... 94 50
Munhall,Pa. U5 ... 75 50
Seattle B3 ... 94 50
So.Chicago,R2,U5,W14 ... 75 50
So.Duquesne,Pa. U5 ... 75 50
So.SanFrancisco B3 ... 94 50

Alloy, Forging (NT)

Bethlehem,Pa. B2 ... $82 00
Buffalo R2 ... 82 00
Canton,O. R2, T7 ... 82 00
Conshohocken,Pa. A3 ... 89 00
Detroit R7 ... 84 00
Fontana,Calif. K1 ... 101 00
Gary,Ind. U5 ... 82 00
Houston S5 ... 92 00
Ind.Harbor,Ind. Y1 ... 82 00
Johnstown,Pa. B2 ... 82 00
Lackawanna,N.Y. B2 ... 82 00
LosAngeles B3 ... 102 00
Massillon,O. R2 ... 82 00
Midland,Pa. C18 ... 82 00
Munhall,Pa. U5 ... 82 00
So.Chicago,R2,U5,W14 ... 82 00
So.Duquesne,Pa. U5 ... 82 00
Struthers,O. Y1 ... 82 00
Warren,O. C17 ... 82 00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ... $92 50
Canton,O. R2 ... 92 50
Cleveland R2 ... 92 50
Fontana,Calif. K1 ... 113 50
Gary,Ind. U5 ... 92 50
Massillon,O. R2 ... 92 50
So.Chicago,Ill. R2 ... 92 50
So.Duquesne,Pa. U5 ... 92 50

SHEET BAR (NT)

Fontana,Calif. K1 ... $93 18

SKELP

Aliquippa,Pa. J5 ... 3 85
Munhall,Pa. U5 ... 3 75
Warren,O. R2 ... 3 75
Youngstown R2, U5 ... 3 75

WIRE RODS

AlabamaCity,Ala. R2 ... 4 525
Aliquippa,Pa. J5 ... 4 525
Alton,Ill. L1 ... 4 70
Buffalo W12 ... 4 525
Cleveland A7 ... 4 525
Cohoes,Pa. A7 ... 4 525
Fairfield,Ala. T2 ... 4 525
Fontana,Calif. K1 ... 5 325
Houston S5 ... 4 925
Johnstown,Pa. B2 ... 4 525
Joliet,Ill. A7 ... 4 525
KansasCity,Mo. S5 ... 4 865
LosAngeles B3 ... 5 325
Minnequa,Colo. C10 ... 4 775
Monessen,Pa. P7 ... 4 725
No.Tonawanda,N.Y. B11 ... 4 525
Pittsburg,Calif. C11 ... 5 175
Portsmouth P12 ... 4 525
Roebling,N.J. R5 ... 4 625
So.Chicago,Ill. R2 ... 4 525
SparrowsPoint,Md. B2 ... 4 625
Sterling,Ill. (1) N15 ... 4 525
Struthers,O. Y1 ... 4 525
Torrance,Calif. C11 ... 5 325
Worcester,Mass. A7 ... 4 825

—STRUCTURALS—

Carbon Steel Stand. Shapes

AlabamaCity,Ala. R2 ... 4 10
Aliquippa,Pa. J5 ... 4 10
Bessemer,Ala. T2 ... 4 10
Bethlehem,Pa. B2 ... 4 15
Clairton,Pa. U5 ... 4 10
Fairfield,Ala. T2 ... 4 10
Fontana,Calif. K1 ... 4 75
Gary,Ind. U5 ... 4 10
Geneva,Utah C11 ... 4 10
Houston S5 ... 4 60
Ind.Harbor,Ind. I-2 ... 4 10
Johnstown,Pa. B2 ... 4 15
KansasCity,Mo. S5 ... 4 80
Lackawanna,N.Y. B2 ... 4 15
LosAngeles B3 ... 4 80
Minnequa,Colo. C10 ... 4 55
Munhall,Pa. U5 ... 4 10
Niles,Calif. (22) P1 ... 4 91
Phoenixville,Pa. P4 ... 4 95
Seattle B3 ... 4 85
So.Chicago,Ill. U5, W14 ... 4 10
So.SanFrancisco B3 ... 4 75
Torrance,Calif. C11 ... 4 80
Weirton,W.Va. W6 ... 4 35

Wide Flange

Bethlehem,Pa. B2 ... 4 15
Clairton,Pa. U5 ... 4 10
Fontana,Calif. K1 ... 5 30
Lackawanna,N.Y. B2 ... 4 15
Munhall,Pa. U5 ... 4 10
So.Chicago,Ill. U5 ... 4 10

Alloy Stand. Shapes

Clairton,Pa. U5 ... 5 00
Fontana,Calif. K1 ... 6 40
Gary,Ind. U5 ... 5 00
Munhall,Pa. U5 ... 5 00
So.Chicago,Ill. U5 ... 5 00

H.S., L.A. Stand. Shapes

Aliquippa,Pa. J5 ... 6 175
Bessemer,Ala. T2 ... 6 175
Bethlehem,Pa. B2 ... 6 20
Clairton,Pa. U5 ... 6 175
Fairfield,Ala. T2 ... 6 175
Fontana,Calif. K1 ... 6 825
Gary,Ind. U5 ... 6 175
Geneva,Utah C11 ... 6 175
Ind.Harbor,Ind. I-2 ... 6 175
Ind.Harbor,Ind. Y1 ... 6 675
Johnstown,Pa. B2 ... 6 20
Lackawanna,N.Y. B2 ... 6 20
LosAngeles B3 ... 6 85
Munhall,Pa. U5 ... 6 175
Seattle B3 ... 6 90
So.Chicago,Ill. U5, W14 ... 6 175
So.SanFrancisco B3 ... 6 80
Struthers,O. Y1 ... 6 675

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ... 6 20
Lackawanna,N.Y. B2 ... 6 20
Munhall,Pa. U5 ... 6 125
So.Chicago,Ill. U5 ... 6 125

BEARING PILES

Munhall,Pa. U5 ... 4 10
So.Chicago,Ill. U5 ... 4 10

—PILING—

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ... 4 925
Lackawanna,N.Y. B2 ... 4 925
Munhall,Pa. U5 ... 4 925
So.Chicago,Ill. U5 ... 4 925

—PLATES—

PLATES, Carbon Steel

AlabamaCity,Ala. R2 ... 4 10
Aliquippa,Pa. J5 ... 4 10
Ashland,Ky. (15) A10 ... 4 10
Bessemer,Ala. T2 ... 4 10
Clairton,Pa. U5 ... 4 10
Claymont,Del. C22 ... 4 30
Cleveland J5, R2 ... 4 10
Coatesville,Pa. L7 ... 4 30
Conshohocken,Pa. A3 ... 4 25
Ecorse,Mich. G5 ... 4 30
Fairfield,Ala. T2 ... 4 10
Fontana,Calif.(30) K1 ... 4 75
Gary,Ind. U5 ... 4 10
Geneva,Utah C11 ... 4 10
GraniteCity,Ill. G4 ... 4 30
Harrisburg,Pa. C5 ... 4 10
Houston S5 ... 4 60
Ind.Harbor,Ind. I-2, Y1 ... 4 10
Johnstown,Pa. B2 ... 4 10
Lackawanna,N.Y. B2 ... 4 10
Minnequa,Colo. C10 ... 4 95
Munhall,Pa. U5 ... 4 10
Pittsburgh J5 ... 4 10
Riverdale,Ill. A1 ... 4 10
Seattle B3 ... 5 00
Sharon,Pa. S3 ... 4 10
So.Chicago,Ill. U5, W14 ... 4 10
SparrowsPoint,Md. B2 ... 4 10
Steubenville,O. W10 ... 4 10
Warren,O. R2 ... 4 10
Weirton,W.Va. W6 ... 4 10
Youngstown R2, U5, Y1 ... 4 10

PLATES, Carbon Abras. Resist.

Fontana,Calif. K1 ... 5 90
Geneva,Utah C11 ... 5 25

PLATES, Wrought Iron

Economy,Pa. B14 ... 9 30

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 ... 6 25
Bessemer,Ala. T2 ... 6 25
Clairton,Pa. U5 ... 6 25
Cleveland J5 ... 6 25
Conshohocken,Pa. A3 ... 6 25
Ecorse,Mich. G5 ... 6 45
Fairfield,Ala. T2 ... 6 25
Fontana,Calif.(30) K1 ... 6 95
Gary,Ind. U5 ... 6 25
Geneva,Utah C11 ... 6 25
Ind.Harbor,Ind. I-2 ... 6 25
Ind.Harbor,Ind. Y1 ... 6 75
Johnstown,Pa. B2 ... 6 25
Lackawanna,N.Y. B2 ... 6 25
Munhall,Pa. U5 ... 6 25
Pittsburgh J5 ... 6 25
Seattle B3 ... 7 15
Sharon,Pa. S3 ... 6 25
So.Chicago,Ill. U5, W14 ... 6 25
SparrowsPoint,Md. B2 ... 6 25
Youngstown U5 ... 6 25
Youngstown Y1 ... 6 75

PLATES, Alloy

Claymont,Del. C22 ... 5 55
Coatesville,Pa. L7 ... 5 45
Fontana,Calif. K1 ... 6 60
Gary,Ind. U5 ... 5 55
Johnstown,Pa. B2 ... 5 50
Munhall,Pa. U5 ... 5 55
Sharon,Pa. S3 ... 5 55
So.Chicago,Ill. U5, W14 ... 5 55
SparrowsPoint,Md. B2 ... 5 55

FLOOR PLATES

Cleveland J5 ... 5 15
Conshohocken,Pa. A3 ... 5 15
Ind.Harbor,Ind. I-2 ... 5 15
Munhall,Pa. U5 ... 5 15
So.Chicago,Ill. U5 ... 5 15

PLATES, Ingot Iron

Ashland,c.l. (15) A10 ... 4 35
Ashland,l.c.l. (15) A10 ... 4 85
Cleveland, c.l. R2 ... 4 70
Warren,O. c.l. R2 ... 4 70

—BARS—

BARS, Hot-Rolled Carbon

AlabamaCity,Ala. R2 ... 4 15
Aliquippa,Pa. J5 ... 4 15
Alton,Ill. L1 ... 4 35
Atlanta,Ga. A11 ... 4 40
Bessemer,Ala. T2 ... 4 15
Buffalo R2 ... 4 15
Canton,O. R2 ... 4 15
Clairton,Pa. U5 ... 4 15
Cleveland R2 ... 4 15
Detroit R7 ... 4 30
Ecorse,Mich. G5 ... 4 35
Emeryville,Calif. J7 ... 4 90
Fairfield,Ala. T2 ... 4 15
Fairless,Pa. U5 ... 4 30
Fontana,Calif. K1 ... 4 85
Gary,Ind. U5 ... 4 15
Houston S5 ... 4 85
Ind.Harbor,Ind. I-2, Y1 ... 4 15
Johnstown,Pa. B2 ... 4 15
KansasCity,Mo. S5 ... 4 85
LosAngeles B3 ... 4 85
Milton,Pa. M18 ... 4 15
Minnequa,Colo. C10 ... 4 60
Niles,Calif. P1 ... 4 85
N.Tonawanda,N.Y. B11 ... 4 15
Pittsburg,Calif. C11 ... 4 85
Pittsburgh J5 ... 4 15
Portland,Oreg. O4 ... 4 90
Seattle B3, N14 ... 4 90
So.Chicago,R2, U5, W14 ... 4 15
So.Duquesne,Pa. U5 ... 4 15
So.SanFran.,Calif. B3 ... 4 90
Sterling,Ill.(1) N15 ... 4 15
Struthers,O. Y1 ... 4 15
Torrance,Calif. C11 ... 4 85
Weirton,W.Va. W6 ... 4 15
Youngstown R2, U5 ... 4 15

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ... 4 875
Buffalo R2 ... 4 875
Canton,O. R2, T7 ... 4 875
Clairton,Pa. U5 ... 4 875
Detroit R7 ... 4 975
Ecorse,Mich. G5 ... 5 075
Fontana,Calif. K1 ... 5 925
Gary,Ind. U5 ... 4 875
Houston S5 ... 5 375
Ind.Harbor,Ind. I-2, Y1 ... 4 875
Johnstown,Pa. B2 ... 4 875
KansasCity,Mo. S5 ... 5 575
Lackawanna,N.Y. B2 ... 4 875
LosAngeles B3 ... 5 925
Massillon,O. R2 ... 4 875
Midland,Pa. C18 ... 4 875
So.Chicago,R2, U5,W14 ... 4 875
So.Duquesne,Pa. U5 ... 4 875
Struthers,O. Y1 ... 4 875
Warren,O. C17 ... 4 875
Youngstown U5 ... 4 875

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ... 6 225
Bessemer,Ala. T2 ... 6 225
Bethlehem,Pa. B2 ... 6 225
Clairton,Pa. U5 ... 6 225
Ecorse,Mich. G5 ... 6 425
Fairfield,Ala. T2 ... 6 225
Fontana,Calif. K1 ... 7 475
Gary,Ind. U5 ... 6 225
Ind.Harb.,Ind. Y1 ... 6 725
Ind.Harb.,Ind. I-2 ... 6 225
Johnstown,Pa. B2 ... 6 225
Lackawanna,N.Y. B2 ... 6 225
LosAngeles B3 ... 6 925
Pittsburgh J5 ... 6 225
Seattle B3 ... 6 975
So.Chicago,W14 ... 6 225
So.Duquesne,Pa. U5 ... 6 225
So.SanFrancisco B3 ... 6 975
Struthers,O. Y1 ... 6 725
Youngstown U5 ... 6 225

BAR SIZE ANGLES, H.R CARBON

Bethlehem,Pa. B2 ... 4 35

BAR SIZE ANGLES, S. Shapes

Aliquippa,Pa. J5 ... 4 15
Atlanta A11 ... 4 40
Niles,Calif. P1 ... 4 85
SanFrancisco S7 ... 5 10

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ... 5 00
Fontana,Calif. K1 ... 6 00
Gary,Ind. U5 ... 5 00
Houston S5 ... 5 70
KansasCity S5 ... 5 90
Youngstown U5 ... 5 00

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ... 5 20
BeaverFalls,Pa. M12, R2 ... 5 20
Buffalo R5 ... 5 25
Camden,N.J. P13 ... 5 65
Carnegie,Pa. C12 ... 5 20
Chicago W18 ... 5 20
Cleveland A7, C20 ... 5 20
Detroit P17, R7 ... 5 35
Detroit B5 ... 5 40
Donora,Pa. A7 ... 5 20
Elyria,O. W8 ... 5 20
FranklinPark,Ill. N5 ... 5 20
Gary,Ind. R2 ... 5 20
GreenBay,Wis. F7 ... 5 20
Hammond,Ind. L2, M13 ... 5 20
Hartford,Conn. R2 ... 5 20
Harvey,Ill. B5 ... 5 20
LosAngeles R2 ... 5 65
Mansfield,Mass. B5 ... 5 75
Massillon,O. R2, R8 ... 5 20
Monaca,Pa. S17 ... 5 20
Newark,N.J. W18 ... 5 65
NewCastle,Pa. (17) B4 ... 5 20
Pittsburgh J5 ... 5 20
Plymouth,Mich. P6 ... 5 45
Putnam,Conn. W18 ... 5 75
Readville,Mass. C14 ... 5 75
St.Louis,Mo. M5 ... 5 60
So.Chicago,Ill. W14 ... 5 20
SpringCity,Pa. K3 ... 5 65
Struthers,O. Y1 ... 5 20
Waukegan,Ill. A7 ... 5 20
Worcester,Mass. W9 ... 6 10
Youngstown F3, Y1 ... 5 20

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md. (5) C19 ... 4 45

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ... 6 325
BeaverFalls,Pa. M12 ... 6 325
Bethlehem,Pa. B2 ... 6 325
Buffalo R5 ... 6 325
Camden,N.J. P13 ... 6 50
Canton,O. R2, T7 ... 6 325
Carnegie,Pa. C12 ... 6 325
Chicago W18 ... 6 325
Cleveland A7, C20 ... 6 325
Detroit P7 ... 6 425
Detroit P17 ... 6 475
Detroit B5 ... 6 525
Donora,Pa. A7 ... 6 325
Elyria,O. W8 ... 6 325
Gary,Ind. R2 ... 6 325
Hammond,Ind. L2, M13 ... 6 325
Hartford,Conn. R2 ... 6 775
Harvey,Ill. B5 ... 6 325
Lackawanna,N.Y. B2 ... 6 325
Mansfield,Mass. B5 ... 6 775
Massillon,O. R2, R8 ... 6 325
Midland,Pa. C18 ... 6 325
Monaca,Pa. S17 ... 6 325
Newark,N.J. W18 ... 6 65
Plymouth,Mich. P5 ... 6 525
So.Chicago,Ill. R2, W14 ... 6 325
SpringCity,Pa. K3 ... 6 475
Struthers,O. Y1 ... 6 325
Warren,O. C17 ... 6 325
Waukegan,Ill. A7 ... 6 325
Worcester,Mass. A7 ... 6 625
Youngstown F3, Y1 ... 6 325

BARS, Reinforcing (Fabricators)

AlabamaCity,Ala. R2 ... 4 15
Atlanta A11 ... 4 40
Buffalo R2 ... 4 15
Cleveland R2 ... 4 15
Emeryville,Calif. J7 ... 4 90
Fairfield,Ala. T2 ... 4 15
Fairless,Pa. U5 ... 4 30
Fontana,Calif. K1 ... 4 85
Gary,Ind. U5 ... 4 15
Houston S5 ... 4 65
Ind.Harbor,Ind. I-2, Y1 ... 4 15
Johnstown,Pa. B2 ... 4 15
KansasCity,Mo. S5 ... 4 85
Lackawanna,N.Y. B2 ... 4 15
LosAngeles B3 ... 4 85
Milton,Pa. M18 ... 4 15
Minnequa,Colo. C10 ... 4 75
Niles,Calif. P1 ... 4 85
Pittsburg,Calif. C11 ... 4 85
Pittsburgh J5 ... 4 15
SandSprings,Okla. S5 ... 5 05
Seattle B3, N14 ... 4 90
So.Chicago,Ill. R2 ... 4 15
So.Duquesne,Pa. U5 ... 4 15
So.SanFrancisco B3 ... 4 90
SparrowsPoint,Md. B2 ... 4 15
Sterling,Ill. (1) N15 ... 4 15
Struthers,O. Y1 ... 4 15
Torrance,Calif. C11 ... 4 85
Youngstown R2, U5 ... 4 15

BARS, Reinforcing (Fabricated; to consumers)

Johnstown, ½-1" B2 ... 5 55
KansasCity S5 ... 6 35
LosAngeles R3 ... 6 18
Marion,O. P11 ... 5 55
Seattle N14 ... 5 80
Seattle B3 ... 6 25
So.SanFrancisco B3 ... 6 25
SparrowsPt., ½-1" B2 ... 5 55
Williamsport,Pa. S19 ... 5 45

RAIL STEEL BARS

Axis,Pa.(4) J8 ... 4 75
ChicagoHts.(3) C2 ... 4 50
ChicagoHts.(4) C2 ... 4 75
ChicagoHts.(3,4) I-2 ... 4 50
FortWorth,Tex.(26) T4 ... 4 65
Franklin,Pa.(3) F5 ... 4 50
Franklin,Pa.(4) F5 ... 4 75
Marion,O.(3) P11 ... 4 50
Moline,Ill.(3) R7 ... 4 25
Tonawanda(3,4) B12 ... 5 00
Williamsport,Pa.(3) S19 ... 5 25
Williamsport,Pa.(4) S19 ... 5 45

BARS, Wrought Iron

Economy,Pa.(S.R.) B14 ... 10 40
Economy,Pa.(D.R.) B14 ... 12 90
Economy(Staybolt) B14 ... 13 20
McK.Rks.(Staybolt) L5 ... 15 50
McK.Rks.(S.R.) L5 ... 10 40
McK.Rks.(D.R.) L5 ... 14 00

—SHEETS—

SHEETS, Hot-Rolled Steel (18 gage and heavier)

AlabamaCity,Ala. R2 ... 3 925
Allenport,Pa. P7 ... 3 925
Ashland,Ky.(8) A10 ... 3 925
Butler,Pa. A10 ... 3 925
Cleveland J5, R2 ... 3 925
Conshohocken,Pa. A3 ... 4 05
Detroit M1 ... 4 15
Ecorse,Mich. G5 ... 4 125
Fairfield,Ala. T2 ... 3 925
Fairless,Pa. U5 ... 4 025
Fontana,Calif. K1 ... 4 70
Gary,Ind. U5 ... 3 925
Geneva,Utah C11 ... 4 025
GraniteCity,Ill. G4 ... 4 125
Ind.Harbor,Ind. I-2, Y1 ... 3 925
Irvin,Pa. U5 ... 3 925
Kokomo,Ind. C16 ... 4 025
Lackawanna,N.Y. B2 ... 3 925

Munhall,Pa. U5 .....3.925
Newport,Ky. N9 .....3.925
Niles,O. [3] N12 .....5.425
Pittsburg,Calif. C11 ..4.625
Pittsburgh J5 .....3.925
Riverdale,Ill. A1 .....3.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ..3.925
SparrowsPoint,Md. B2..3.925
Steubenville,O. W10 ..3.925
Torrance,Calif. C11 ..4.625
Warren,O. R2 .....3.925
Weirton,W.Va. W6 ..3.925
Youngstown U5, Y1 ..3.925

SHEETS, H.R. (19 gage)

AlabamaCity, Ala. R2..5.225
Dover,O. R1 .....5.05
Kokomo,Ind. C16 5.025
Mansfield,O. E6 .....5.05
Niles,O. N12 .....5.20
Torrance,Calif. C11 ...5.875

SHEETS, H.R. (14 ga. heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....5.90
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.10
Fairfield,Ala. T2 .....5.90
Fontana,Calif. K1 6.075
Gary,Ind. U5 .....5.90
Ind Harbor,Ind. I-2 ....5.90
Ind.Harbor,Ind. Y1 ....6.40
Irvin,Pa. U5 .....5.90
Lackawanna(35) B2 ...5.90
Munhall,Pa. U5 .....5.90
Pittsburgh J5 .....5.90
Sharon,Pa. S3 .....5.90
So.Chicago,Ill. U5 ....5.90
SparrowsPoint(38) B2..5.90
Warren,O. R2 .....5.90
Weirton,W.Va. W6 5.90
Youngstown U5 .....5.90
Youngstown Y1 .....6.40

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..4.175
Cleveland R2 .....4.525
Ind Harbor,Ind. I-2 ..4.175
Warren,O. R2 .....4.525

SHEETS, Cold-Rolled Steel (Commercial Quality)

Allenport,Pa. P7 .....4.775
Butler,Pa. A10 .....4.775
Cleveland J5, R2 .....4.775
Ecorse,Mich. G5 .....4.925
Fairfield,Ala. T2 .....4.775
Fairless,Pa. U5 .....4.875
Follansbee,W.Va. F4 ..5.775
Fontana,Calif. K1 ....5.875
Gary,Ind. U5 .....4.775
GraniteCity,Ill. G4 ....4.975
Ind Harbor,Ind. I-2,Y1 4.775
Irvin,Pa. U5 .....4.775
Lackawanna,N.Y. B2 ..4.775
Middletown,O. A10 ....4.775
Pittsburg,Calif. C11 ..5.725
Pittsburgh J5 .....4.775
SparrowsPoint,Md. B2 4.775
Steubenville,O. W10 ..4.775
Warren,O. R2 .....4.775
Weirton,W.Va. W6 ...4.775
Youngstown Y1 .....4.775

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.225
Ecorse,Mich. G5 .....7.425
Fontana,Calif. K1 ....8.275
Gary,Ind. U5 .....7.225
IndianaHarbor,Ind. Y1 7.725
Irvin,Pa. U5 .....7.225
Lackawanna(37) B2 ...7.225
Pittsburgh J5 .....7.225
SparrowsPoint (38) B2 7.225
Warren,O. R2 .....7.225
Weirton,W.Va. W6 7.275
Youngstown Y1 .....7.725

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10 .....5.275
Cleveland R2 .....5.375
Middletown,O. A10 ....5.275
Warren,O. R2 .....5.375

SHEETS, Gal'd No. 10 Steel

AlabamaCity,Ala. R2..5.275
Ashland,Ky. (8) A10 ...5.275
Canton,O. R2 .....5.275
Delphos,O. N10 5.275
Dover,O. R1 .....5.275
Fairfield,Ala. T2 ....5.275†
Gary,Ind. U5 .....5.275†
GraniteCity,Ill. G4 ....5.475
Ind.Harbor,Ind. I-2 ....5.325
Irvin,Pa. U5 .....5.275†
Kokomo,Ind.(13) C16..5.375
MartinsFerry,O. W10 ..5.275
Niles,O. N12 .....5.80
Pittsburg,Calif. C11 ...6.025†
SparrowsPoint,Md. B2 5.275
Steubenville,O. W10 ...5.275
Torrance,Calif. C11 ..6.275†
Weirton,W.Va. W6 ....5.275

†Based on 5c zinc.

SHEETS, Galvanized No. 10 High-Strength Low-Alloy

Irvin,Pa. U5 .....7.925
SparrowsPoint(39) B2 .8.075

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ..5.525
Canton,O. R2 .....6.025

SHEETS, Culvert

	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.325	....
Canton,O. R2	6.475	6.925
Fairfield, T2	6.075	6.325
Gary,Ind. U5	6.075	6.325
Ind Harbor I-2	6.075	6.325
Irvin,Pa. U5	6.075	6.325
Kokomo,Ind. C16	6.525	....
MartinsFry.,O.W10	6.075	...
Pitts.,Cal. C11	6.825	....
SparrowsPt. B2	6.075	....
Torrance,Cal. C11	6.825	....

SHEETS, Culvert

	Pure Iron
Ashland,Ky. A10	6.575
Fairfield, Ala. T2	6.325
MartinsFerry,O. W10	6.325

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.825
Irvin,Pa. U5 .....5.825†
Kokomo,Ind.(13) C16..5.925
Niles,O. N12 .....6.35

†Based on 5c zinc.

SHEETS, ZINCGRIP Steel

Butler,Pa. A10 .....5.525
Middletown,O. A10 ....5.525

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.775
Middletown,O. A10 ....5.775

SHEETS, Electrogalvanized

Cleveland R2 (28) 6.125
Niles,O. R2 (28) 6.125
Weirton,W.Va. W6 ....5.975

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.625

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.175
Gary,Ind. U5 .....5.175
GraniteCity,Ill. G4 ...5.875
Ind Harbor,Ind. I-2 ...5.175
Irvin,Pa. U5 .....5.175
Middletown,O. A10 ....5.175
Niles,O. N12 .....6.775
Youngstown Y1 .....5.175

BLUED STOCK, 29 ga.

Yorkville,O. W10 .....7.20
Follansbee,W.Va. F4 ..7.30
Follansbee (23) F4 ...7.175

SHEETS, Long Terne Steel (Commercial Quality)

BeechBott'm,W.Va.W10 5.675
Gary,Ind. U5 .....5.675
Mansfield,O. E6 .....5.675
Middletown,O. A10 ....5.675
Niles,O. N12 .....6.00
Weirton,W.Va. W6 ...5.675

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.075

SHEETS, Well Casing

Fontana,Calif. K1 ....6.20

—STRIP—

STRIP, Hot-Rolled Carbon

Ala City,Ala.(27) R2 ..3.925
Allenport,Pa. P7 .....3.925
Alton,Ill. L1 4.10
Ashland,Ky.(8) A10 ...3.925
Atlanta A11 .....4.175
Bessemer,Ala. T2 .....3.925
Bridgeport,Conn.(10)S15 4.15
Buffalo (27) R2 .....3.925
Butler,Pa. (8) A10 ...3.925
Carnegie,Pa. S18 .....4.425
Conshohocken,Pa. A3 ...4.05
Detroit M1 .....4.15
Ecorse,Mich. G5 .....4.125
Fairfield,Ala. T2 .....3.925
Fontana,Calif. K1 .....4.50
Gary,Ind. U5 .....3.925
Houston,Tex. S5 .....4.425
Ind Harbor,Ind. I-2,Y1 3.925
Johnstown,Pa.(25) B2 ..3.925
KansasCity,Mo.(9) S5 4.625
Lackw'na,N.Y.(32) B2 3.925
LosAngeles(25) B3 ....4.675
Milton,Pa. M18 .....3.925
Minnequa,Colo. C10 ...5.025
NewBritain(10) S15 .....4.15
N.Tonawanda,N.Y.B11 3.925
Pittsburg,Calif. C11 ...4.675
Riverdale,Ill. A1 .....3.925
SanFrancisco S7 .....5.10
Seattle(25) B3 .....4.925
Seattle, N14 .....4.925
Sharon,Pa. S3 .....3.925
So.Chicago,Ill. W14 ...3.925
So.SanFrancisco(25)B3 4.675
SparrowsPoint,Md. B2 3.925
Torrance,Calif. C11 ...4.675
Warren,O. R2 .....3.925
Weirton,W.Va. W6 5.925
Youngstown U5 .....3.925

STRIP, Hot-Rolled Alloy

Bridgeport,Conn.(10)S15 6.45
Carnegie,Pa. S18 .....6.40
Fontana,Calif. K1 .....7.80
Gary,Ind. U5 .....6.40
Houston,Tex. S5 .....6.90
KansasCity,Mo. S5 ....7.10
LosAngeles B3 .....7.60
NewBritn.,Conn.(10)S15 6.45
Sharon,Pa. S3 .....6.40
So.Chicago W14 .....6.40
Youngstown U5 .....6.40

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2 .....5.65
Conshohocken,Pa. A3 ..5.90
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....5.65
Fontana,Calif. K1 ....7.05
Gary,Ind. U5 .....5.95
Ind Harbor,Ind. I-2 ....5.95
Ind Harbor,Ind. Y1 ....6.45
Lackawanna,N.Y. B2 ...6.00
LosAngeles(25) B3 ....6.40
Seattle(25) B3 .....6.65
Sharon,Pa. S3 .....5.95
So.SanFrancisco(25)B3 .6.40
SparrowsPoint,Md. B2 ..6.00
Warren,O. R2 .....5.95
Weirton,W.Va. W6 5.95
Youngstown Y1 .....6.45
Youngstown U5 .....5.95

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10 ..4.175
Warren,O. R2 .....4.525

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6 .....5.80
Bridgeprt,Conn. (10)S15 5.75
Butler,Pa. A10 .....5.45
Cleveland A7, J5 .....5.45
Dearborn,Mich. D3 ....5.70
Detroit D2, P20 .....5.70
Detroit M1 .....5.65
Dover,O. G6 .....5.80
Ecorse,Mich. G5 .....5.65
Follansbee,W.Va. F4 ...5.45
Fontana,Calif. K1 ....7.35
Franklin Park,Ill. T6 ..5.70
Ind Harbor,Ind. I-2 ....5.70
Lackawanna,N.Y. B2 ...5.45
LosAngeles C1 .....7.50
Mattapan,Mass. T6 ....6.30
Middletown,O. A10 ....5.45
NewBedford,Mass. R10..6.40
NewBritain(10) S15 ....5.75
NewCastle,Pa. B4, E5..5.45
New Haven,Conn. A7 6.20
NewHaven,Conn. D2 ...6.20
Pawtucket,R.I. R3 ....6.80
Pawtucket,R.I. N8 6.30
Riverdale,Ill. A1 .....5.60
Rome,N.Y.(29) R6 .....5.45
Sharon,Pa. S3 .....5.45
SparrowsPoint,Md. B2 ..5.45
Trenton,N.J. R5 .....7.00
Wallingford,Conn. W2 ...6.20
Warren,O.(10) T6 .....5.45
Warren,O. B9 .....5.75
Warren,O. R2 .....5.45
Weirton,W.Va. W6 ....5.45
Worcester,Mass. W19 ...7.05
Worcester,Mass. A7 6.30
Youngstown C8 .....5.95
Youngstown Y1 .....5.45

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 12.15
Carnegie,Pa. S18 .....12.00
Cleveland A7 .....12.00
Dover,O. G6 .....12.00
Fontana,Calif. K1 ....13.65
Harrison,N.J. C18 .....12.00
NewBritn,Conn.(10)S15 12.15
Pawtucket,R.I.(11) NS 12.15
Pawtucket,R.I.(12) NS 12.45
Sharon,Pa. S3 .....12.00
Worcester,Mass. A7 ...12.30
Youngstown C8 .....12.00

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5 .....7.80
Cleveland A7 .....8.15
Dearborn,Mich. D3 ....7.90
Dover,O. G6 .....8.00
Ecorse,Mich. G5 .....8.35
LackawannaN.Y. B2 ..8.15
Sharon,Pa. S3 .....7.65
SparrowsPoint,Md. B2 ..8.15
Warren,O. R2 .....7.60
Weirton,W.Va. W6 8.15
Youngstown Y1 .....8.30

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....6.05

STRIP, Electrogalvanized

Dover,O. G6 .....5.70
Warren,O. T5 .....5.45
Weirton,W.Va. W6 ....5.45
Youngstown C8 .....5.95

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.65
Riverdale,Ill. A1 .....4.50
Sharon,Pa. S3 .....4.35
Youngstown U5 .....4.35

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Co.
A7 American Steel & Wire
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.
B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co. Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Div. H. K. Porter Co.
B14 A. M. Byers Co.
B15 J. Bishop & Co.
C1, Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept., Wickwire Spencer Steel Division
C23 Charter Wire Products
C24 G. O. Carlson Inc.
D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.
E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.
F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.
G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
H1 Hanna Furnace Corp.
H7 Helical Tube Co.
I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-7 Indiana Steel & Wire Co.
J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.
K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.
L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Madart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman & Scott
N2 National Supply Co.
N3 National Tube Div.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N12 Niles Rolling Mill Div.
N14 Nethwst Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills
P1 Pacific States Steel Corp.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P20 Prod.Steel Strip Corp.
R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div. Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.
S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanely Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 StainlessWeldedProducts
S26 Specialty Wire Co. Inc.
T2 Tenn. Coal & Iron Div.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W.Va. Steel & Mfg. Co.
W8 West.Auto Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel
Y1 Youngstown Sheet & Tube

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	8.00	8.60	10.55	12.85
Bridgeport,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
Bristol,Conn. W1	...	...	8.90	10.85	...
Carnegie,Pa. S18	...	7.65	8.60	10.55	12.85
Cleveland A7	5.45	7.65	8.60	10.55	12.85
Dearborn,Mich. D3	5.70	7.85	8.80	...	...
Detroit D2	6.45	7.85	8.45	10.55	...
Dover,O. G6	6.05	8.00	8.60	10.55	12.85
Franklin Park,Ill. T6	5.80	7.80	8.75	10.70	...
Harrison,N.J. C18	...	...	8.90	10.85	13.15
Mattapan,Mass. T6	6.30	7.95	8.90	10.85	13.15
NewBritn.,Conn.(10) S15	5.75	7.65	8.60	10.55	12.85
NewCastle,Pa. B4	5.45	7.65	8.60	...	...
NewCastle,Pa. E5	5.45	8.00	8.60	10.55	12.85
NewHaven,Conn. D2	6.70	7.95	8.55	10.50	...
NewYork W3	...	8.30	8.90	10.85	13.15
Pawtucket,R.I. N5	...	8.00	8.60	10.55	12.85
Cleve.orPitts.Base	...	7.95	8.90	10.85	13.15
Worcester,Mass.,Base	6.65	7.95	8.60	10.55	12.85
Sharon,Pa. S3	5.45	7.65	8.90	10.85	13.15
Trenton,N.J. R5	...	7.95	8.60	10.55	12.85
Wallingford,Conn. W2	6.20	7.95	8.90	10.85	13.15
Warren,O. T5	5.45	7.65	8.60	10.55	12.85
Weirton,W.Va. W6	5.45	7.65	8.60	10.55	12.85
Worcester,Mass. A7	5.75	7.95	8.90	10.85	13.15
Worcester,Mass. T6	6.30	7.95	8.90	10.85	13.15
Youngstown C8	...	8.00	8.60	10.55	12.85

Spring Steel (Tempered)

Bristol,Conn. W1	...	12.50	15.00	...
Franklin Park,Ill. T6	...	12.50	15.00	18.00
Harrison,N.J. C18	...	12.50	15.00	18.00
NewYork W3	...	12.50	15.00	18.00
Trenton,N.J. R5	...	12.50	15.00	18.00
Worcester,Mass. T6	...	12.50	15.00	18.00
Youngstown C8	...	12.50	15.00	18.00

SILICON STEEL

SHEETS, SILICON, H.R. or C.R.(22 Ga.)

COILS (cut lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W10 (cut lengths)	...	...	8.35	9.60	10.40
Brackenridge,Pa. A4	...	...	8.85	10.10	10.90
GraniteCity,Ill. G4 (cut lengths)	...	...	8.55	9.80	...
IndianaHarbor,Ind. I-2	8.05	8.35	8.85	(34)	...
Mansfield,O. E6 (cut lengths)	7.55	7.85	8.35	9.60	10.40
Newport,Ky. N9 (cut lengths)	...	7.85	8.35	9.60	10.40
Niles,O. N12 (cut lengths)	7.55	7.85	8.35	...	...
Vandergrift,Pa. U5	...	8.35	8.85	10.10	10.90
Warren,O. R2	8.05	8.35	8.85	10.10	10.90
Zanesville,O. A10	...	8.35	8.85	10.10	10.90

SHEET, SILICON (22 Ga. Base)

COILS (Cut Lengths ½c lower)	Transformer Grade 72	65	58	52
BeechBottom W10 (cut lengths)	10.95	11.50	12.20	13.00
Brackenridge,Pa. A4	11.45	...	...	...
Newport,Ky. N9 (cut lengths)	10.95	...	...	...
Vandergrift,Pa. U5	11.45	12.00	12.70	13.50
Warren,O. R2	11.45	...	...	...
Zanesville,O. A10	11.45	12.00	12.70	13.50

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	...	...	16.05	16.55
Vandergrift,Pa. U5	14.00	14.85	15.85	16.35

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Fairless,Pa. U5	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
GraniteCity,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40	7.65	8.05
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

TIN PLATE, American Cokе (Base Box)

	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$8.70	$8.95
Fairfield,Ala. T2	8.80	9.05
Fairless,Pa. U5	8.80	9.05
Gary,Ind. U5	8.70	8.95
Ind.Har. I-2, Y1	8.70	8.95
Irvin,Pa. U5	8.70	8.95
Pitts.,Cal. C11	9.45	9.70
Sp.Pt.,Md. B2	8.80	9.05
Warren,O. R2	8.70	...
Weirton,W.Va.W6	8.70	8.95
Yorkville,O. W10	8.70	8.95

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.50
Fairfield,Ala. T2	6.60
Fairless,Pa. U5	6.60
Gary,Ind. U5	6.50
GraniteCity,Ill. G4	6.70
Ind.Harbor,Ind. I-2,Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	6.10
Gary,Ind. U5	6.10
GraniteCity,Ill. G4	6.30
Ind.Harbor,Ind. Y1	6.10
Irvin,Pa. U5	6.10
Yorkville,O. W10	6.55

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

MANUFACTURING TERNES, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

MANUFACTURING TERNES, LT. Coated, 6 lb

Yorkville,O. W10	$8.65

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

—WIRE—

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.525
Aliquippa,Pa. J5	5.525
Alton,Ill. L1	5.70
Atlanta A11	5.775
Bartonville,Ill. K4	5.625
Buffalo W12	5.525
Chicago W13	5.525
Cleveland A7, C20	5.525
Crawfordsville,Ind. M8	5.625
Donora,Pa. A7	5.525
Duluth,Minn. A7	5.525
Fairfield,Ala. T2	5.525
Fostoria,O. C24; S1	5.75
Houston S5	5.925
Johnstown,Pa. B2	5.525
Joliet,Ill. A7	5.525
KansasCity,Mo. S5	6.125
Kokomo,Ind. C16	5.625
LosAngeles B3	6.475
Minnequa,Colo. C10	5.775
Monessen,Pa. P7	5.525
No.Tonawanda B11	5.525
Palmer,Mass. W12	5.825
Pittsburg,Calif. C11	6.475
Portsmouth,O. P12	5.525
Rankin,Pa. A7	5.525
So.Chicago,Ill. R2	5.525
So.SanFrancisco C10	6.475
SparrowsPoint,Md. B2	5.625
Sterling,Ill. (1) N15	5.525
Struthers,O. Y1	5.525
Torrance,Calif. C11	6.475
Waukegan,Ill. A7	5.525
Worcester,Mass. A7	5.825

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.925
Alton,Ill. L1	7.10
Bartonville,Ill. K4	7.025
Buffalo W12	6.925
Cleveland A7	6.925
Donora,Pa. A7	6.925
Duluth,Minn. A7	6.925
Fostoria,O. S1	6.925
Johnstown,Pa. B2	6.925
Millbury,Mass. (12) N6	7.225
Minnequa,Colo. C10	7.175
Monessen,Pa. P7	6.925
Monessen,Pa. P16	6.95
Muncie,Ind. I-7	7.125
Palmer,Mass. W12	7.225
Pittsburg,Calif. C11	7.875
Portsmouth,O. P12	6.925
Roebling,N.J. R5	7.225
So.Chicago,Ill. R2	6.925
So.SanFran. C10	7.875
SparrowsPt.,Md. B2	7.025
Struthers,O. Y1	6.925
Trenton,N.J. A7	7.225
Waukegan,Ill. A7	6.925
Worcester A7, J4	7.225
Worcester T6, W12	7.225

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.625
Alton,Ill. L1	6.80
Buffalo W12	6.625
Cleveland A7	6.625
Donora,Pa. A7	6.625
Duluth,Minn. A7	6.625
Johnstown,Pa. B2	6.625
LosAngeles B3	7.575
Minnequa,Colo. C10	6.875
Monessen,Pa. P7, P16	6.625
NewHaven,Conn. A7	6.925
Palmer,Mass. W12	6.925
Pittsburg,Calif. C11	7.575
Portsmouth,O. P12	6.625
Roebling,N.J. R5	6.925
So.Chicago,Ill. R2	6.625
So.SanFrancisco C10	7.575
SparrowsPoint,Md. B2	6.725
Torrance,Calif. C11	7.575
Trenton,N.J. A7	6.925
Waukegan,Ill. A7	6.625
Worcester,Mass. A7	6.925

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	10.75
Bartonville,Ill. K4	10.65
Buffalo W12	10.55
Chicago W13	10.55
Cleveland A7	10.55
Crawfordsville,Ind. M8	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Kokomo,Ind. C16	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Roebling,N.J. R5	10.85
So.SanFrancisco C10	10.90
Waukegan,Ill. A7	10.55
Worcester,Mass. A7, T6	10.85

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	9.50
Johnstown,Pa. B2	9.50
Monessen,Pa. P16	9.50
Muncie,Ind. I-7	9.70
Roebling,N.J. R5	9.80
SparrowsPt.,Md. B2	9.60

ROPE WIRE

	(A)
Alton,Ill. L1	9.45
Bartonville,Ill. K4	9.45
Buffalo W12	9.35
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.35
Monessen,Pa. P7, P16	9.35
Muncie,Ind. I-7	9.55
Palmer,Mass. W12	9.65
Portsmouth,O. P12	9.35
Roebling,N.J. R5	9.65
SparrowsPt. B2	9.45
Struthers,O. Y1	9.35
Worcester J4, T6	9.65

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Tire Bead

Alton,Ill. L1	12.75
Bartonville,Ill. K4	12.65
Monessen,Pa. P16	12.00
Roebling,N.J. R5	12.85

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	7.45
Buffalo W12	7.45
Cleveland A7	7.45
Crawfordsville,Ind. M8	7.55
Dover,O. G6	7.45
Fostoria,O. S1	7.45
Kokomo,Ind. C16	7.55
FranklinPark,Ill. T6	7.60
Massillon,O. R8	7.45
Monessen,Pa. P16	8.00
Monessen,Pa. P7	7.45
Pawtkt.R.I.(12) N8	7.75
Trenton,N.J. R5	7.75
Worcester A7, T6, W12	7.75

WIRE, Merchant Quality (6 to 8 gage)

	An'ld. Galv.
Ala.City R2	6.675 7.07½••
Aliquippa J5	6.675 7.20•
Atlanta A11	6.925 7.475
Bartonville(19)K4	6.675 7.225
Buffalo W12	6.675 7.075
Cleveland A7	6.675
CrawfordsvilleM8	6.775 7.325
Donora,Pa. A7	6.675 7.075†
Duluth,Minn. A7	6.675 7.075†
Fairfield T2	6.675 7.075†
Houston,Tex. S5	7.075 7.475
JohnstownB2(48)	6.675 7.225
Joliet,Ill. A7	6.675 7.075†
KansasCity,Mo.S5	7.275 7.675
Kokomo,Ind. C16	6.775 7.175
LosAngeles B3	7.625
Minnequa C10	6.925 7.325••
Monessen P7(48)	6.675 7.225
Palmer,Mass. W12	6.975 7.375
Pitts.,Calif. C11	7.625 8.025†
Prtsmth (18) P12	6.675
Rankin,Pa. A7	6.675 7.075†
So.Chi'go R2	6.675 7.675••
So.S.Fra.(48)C10	7.625 8.025••
Spar'wsPt. B2(48)	6.775 7.325
Sterl'g(1)(48)N15	6.675 7.225
Struthers,O. Y1	6.675 7.175
Worcester A7	6.975

* Based on 10c zinc; † 5c zinc; ••Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	149
Atlanta A11	152
Bartonville,Ill.(19) K4	149
Crawfordsville,Ind. M8	151
Donora,Pa. A7	149
Duluth,Minn. A7	149
Fairfield,Ala. T2	149
Joliet,Ill. A7	149
KansasCity,Mo. S5	161
Kokomo,Ind. C16	151
Minnequa,Colo. C10	154
Pittsburg,Calif. C11	173
So.Chicago,Ill. R2	149
So.SanFran.Calif. C10	173
SparrowsPoint,Md. B2	151
Sterling,Ill.(1) N15	149

WOVEN FENCE, 9-15½ Ga. Col.

Ala.City,Ala. R2	140••
Ala.City 17 ga. R2	235••
Ala.City 18 ga. R2	245••
Aliq'ppa,Pa.9-14½ga. J5	143•
Atlanta A11	146
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140†
Duluth,Minn. A7	140†
Fairfield,Ala. T2	140†
Houston,Tex. S5	142
Johnstown,Pa. B2	142
Johnstown 17 ga. 6"B2	234
Johnstown 4" B2	237
Joliet,Ill. A7	140†
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	145••
Monessen,Pa. 9 ga. P7	145
Pittsburg,Calif. C11	163†
Rankin,Pa. A7	140†
So.Chicago,Ill. R2	146••
Sterling,Ill. (1) N15	143

† Based on 5c zinc; • 11c zinc; •• Subject to zinc equalization extras.

WIRE, Barbed

	Col.
AlabamaCity R2	153••
Aliquippa J5	150••
Atlanta A11	159
Bartonville,Ill. (19) K4	156
Crawfordsville,Ind. M8	159
Donora,Pa. A7	153†
Duluth,Minn. A7	153†
Fairfield,Ala. T2	153†
Houston,Tex. S5	161
Johnstown,Pa. B2	156
Joliet,Ill. A7	153
KansasCity,Mo. S5	165
Kokomo,Ind. C16	155
Minnequa,Colo. C10	159••
Monessen,Pa. P7	157
Pittsburg,Calif. C11	173†
Rankin,Pa. A7	153†
So.Chicago,Ill. R2	153••
S.SanFrancisco C10	173••
SparrowsPoint,Md. B2	158
Sterling,Ill. (1) N15	143

† Based on 5c zinc; • 11c zinc; •• Subject to zinc equalization extras.

WIRE, (16 gage)

	An'ld. Galv.	Stone
Ala.City R2	12.50	14.05••
Aliquippa J5	12.50	14.30•
Bartonville(19)K4	10.73	12.51
Cleveland A7	12.50	...
Crawfordsville M8	12.50	14.35
Fostoria,O. S1	12.60	14.15
Johnstown,B2	12.50	14.35
Kokomo,Ind. C16	12.60	14.15
Minnequa,Colo. C10	12.75	14.45••
Palmer,Mass.W12	12.50	14.05
Pitts.,Calif. C11	12.85	14.40†
So.Chicago R2	12.50	14.05••
SparrowsPt. B2	12.60	14.45
Sterling(1) N15	10.73	12.15
Waukegan A7	12.50	14.05†
Worcester A7	12.80	...

* Based on 11c zinc; † 5c zinc; •• Subject to zinc equalization extras.

NAILS, Stock To dealers & mfrs. (7)

	Col.
AlabamaCity,Ala. R2	131
Aliquippa,Pa. J5	131
Atlanta A11	134
Bartonville,Ill. (19) K4	131
Chicago,Ill. W13	131
Cleveland A9	137
Crawfordsville,Ind. M8	133
Donora,Pa. A7	131
Duluth, Minn. A7	131
Fairfield,Ala. T2	131
Galveston,Tex. D7	139
Houston,Tex. S5	139
Johnstown,Pa. B2	131
Joliet,Ill. A7	131
KansasCity,Mo. S5	143
Kokomo,Ind. C16	133
Minnequa,Colo. C10	136
Monessen,Pa. P7	131
Pittsburg,Calif. C11	150
Portsmouth,O. P12	132
Rankin,Pa. A7	131
So.Chicago,Ill. R2	131
SparrowsPt., Md. B2	133
Sterling,Ill. (1) N15	131
Worcester,Mass. A7	137

NAILS, Cut (100 lb keg) To dealers (33)

Conshohocken,Pa. A3	$8.00
Wheeling,W.Va. W10	8.00

STAPLES, Polished, Stock To dealers & mfrs. (7)

	Col.
AlabamaCity,Ala. R2	133
Aliquippa,Pa. J5	133
Atlanta A11	136
Bartonville,Ill. (19) K4	133
Crawfordsville,Ind. M8	135
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Johnstown,Pa. B2	133
Joliet,Ill. A7	133
Kokomo,Ind. C16	135
Minnequa,Colo. C10	138
Monessen,Pa. P7	133
Pittsburg,Calif. C11	152
Portsmouth,O. P12	132
Rankin,Pa. A7	133
So.Chicago,Ill. R2	133
SparrowsPt.,Md. B2	135
Sterling,Ill. (1) N15	133
Worcester,Mass. A7	139

—FENCE POSTS—

	Col.
ChicagoHts., Ill. C2, I-2	145
Duluth,Minn. A7 (49)	136
Franklin,Pa. F5	145
Johnstown,Pa. B2	145
Marion,O. P11	145
Minnequa,Colo. C10	150
Moline,Ill. R2	145
So.Chicago,Ill. R2	145
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	158

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	23.5	8.25
Ambridge, Pa. N2 (†)	15.75	...	19.75	...	22.25	...	23.75	...	23.75	...	23	...	23.5	...
Lorain, O. N3 (*)	15.75	4.5	19.75	5.5	22.25	8	23.75	9.5	23.75	9.5	23	8.75	23.5	11.25
Youngstown Y1 (††)	15.75	list	19.75	2.5	22.25	5	23.75	6.5	23.75	6.5	23	5.75	23.5	8.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2 (**)	15.75	0.75	19.75	3	22.25	5.5	23.75	7	23.75	7	23	6.25	23.5	8.75

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c		27.5c			
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28		2.73			
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5		
Alton, Ill. L1 ($)	...	...	...	...	...	...	24.25	9	27.25	13	29.75	16.5	32.25	17.5	32.75	18.25		
Benwood, W. Va. W10(††)	25.5	+0.75	17.75	+6	10.25	+10.75	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5		
Butler, Pa. F6 (†)	26.5	+2.75	19.5	+7.25	12.5	+13	...	...	...	...	...	...	...	...	...	...		
Etna, Pa. N2 (†)	...	...	...	...	...	...	26.25	7	29.25	11	31.75	14.5	34.25	16.25	34.75	17.25		
Fontana, Calif. K1 ($)	...	...	...	...	...	...	13.25	+3	16.25	1	18.75	4.5	24.25	5.5	21.75	6.5		
Ind. Harbor, Y1 (††)	...	...	...	...	...	...	25.25	9	28.25	13	30.75	16.5	33.25	17.5	33.75	18.5		
Lorain, O. N3 (*)	...	...	...	...	...	...	26.25	16	29.25	20	31.75	23.5	34.25	23	34.75	24		
Sharon, Pa. S4 (†)	26.5	−0.25	19.5	+4.25	12.5	+8.5	...	...	...	...	...	...	...	...	...	...		
Sharon, Pa. M6	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25		
Sparrows Pt., Md. B2 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	24.25	8	27.25	12	29.75	15.5	32.25	16.5	32.75	17.5		
Youngstown R2 (**)	...	...	...	...	...	...	26.25	11	29.25	15	31.75	18.5	34.25	19.25	34.75	20.25		
Youngstown Y1 (††)	...	...	...	...	...	...	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5		
Wheatland, Pa. W9 ($)	24.5	+1.75	17.5	+6.25	10.5	+10.5	26.25	10	29.25	14	31.75	17.5	34.25	18.5	34.75	19.5		

Size—Inches	2		2½		3		3½		4	
List Per Ft	37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...
Alton, Ill. L1 ($)	33.25	18.75	34.75	18	34.75	18	...	...	...	...
Benwood, W. Va. W10(††)	35.25	20	36.75	20	36.75	20	27.75	10.5	27.75	10.5
Etna, Pa. N2 (†)	35.25	17.25	36.75	18.5	36.75	18.5	27.75	9	27.75	9
Fontana, Calif. K1 ($)	22.25	7	23.75	7	23.75	7	...	...	...	...
Ind. Harbor, Ind. Y1 (††)	34.25	19	35.75	19	35.75	19	...	...	...	...
Lorain, O. N3 (*)	35.25	24.5	36.75	23	36.75	23	...	...	...	...
Sharon, Pa. M6	35.25	20.75	36.75	20.5	36.75	20.5	...	...	...	...
Sparrows Pt., Md. B2 ($)	32.25	18	34.75	18	34.75	18	25.75	8.5	25.75	8.5
Youngstown R2 (**)	35.25	20.75	36.75	20.5	36.75	20.5	27.75	11	27.75	11
Youngstown Y1 (††)	35.25	20	36.75	20	36.75	20	...	...	...	...
Wheatland, Pa. W9 (‡)	35.25	20	36.75	20	36.75	20	...	...	...	...

Galvanized pipe discounts based on zinc price of: (†), 14c; (‡), 11c to under 12c; (*), 5c; ($), 10c to under 11c; (††), 10.50c-11.50c; with discounts adjusted on prices of zinc at time of shipment.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	...	21.31	18.44
1¼	13	...	25.24	18.12
1½	13	23.12	27.89	20.01
1¾	13	26.84	32.37	23.66
2	13	30.08	36.28	26.51
2¼	13	34.18	41.23	29.86
2¼	12	37.10	44.75	32.41
2½	12	40.51	48.86	35.70
2¾	12	43.85	52.90	38.66
3	12	45.92	55.39	41.23

RAILWAY MATERIALS

RAILS	Std. No. 1	Std. No. 2	Std. Tee Rails All No. 2	60 lb Under
Bessemer,Pa. U5	4.325	4.225	4.275	5.20
Ensley,Ala. T2	4.325	4.225	...	5.20
Fairfield,Ala. T2	...	...	...	5.20
Gary,Ind. U5	4.325	4.225	4.275	...
Huntington,W.Va. W7	...	...	...	5.20
IndianaHarbor,Ind. I-2	4.325	4.225	4.275	...
Johnstown,Pa. B2	...	...	...(16)	5.20
Lackawanna,N.Y. B2	4.325	4.225	...	5.20
Minnequa,Colo. C10	4.325	4.125	...	5.70
Steelton,Pa. B2	4.325	4.225	...	...
Williamsport,Pa. S19	...	...	...	5.20

TIE PLATES	
Fairfield,Ala. T2	5.125
Gary,Ind. U5	5.125
Ind.Harbor,Ind. I-2	5.125
Lackawanna,N.Y. B2	5.125
Minnequa,Colo. C10	5.125
Pittsburg,Calif. C11	5.275
Seattle B3	5.275
Steelton,Pa. B2	5.125
Torrance,Calif. C11	5.275

TRACK BOLTS (20) Treated	
KansasCity,Mo. S5	11.00
Lebanon,Pa. B2	11.00
Minnequa,Colo. C10	11.00
Pittsburgh O3, P14	11.00

JOINT BARS	
Bessemer,Pa. U5	5.275
Fairfield,Ala. T2	5.275
Ind.Harbor,Ind. I-2	5.275
Joliet,Ill. U5	5.275
Lackawanna,N.Y. B2	5.275
Minnequa,Colo. C10	5.275
Steelton,Pa. B2	5.275

AXLES	
Ind.Harbor,Ind. S13	6.50
Johnstown,Pa. B2	6.50

STANDARD TRACK SPIKES	
Ind-Harbor,Ind. I-2, Y1	7.05
KansasCity,Mo. S5	7.30
Lebanon,Pa. B2	7.05
Minnequa,Colo. C10	7.05
Pittsburgh J3	7.05
Seattle B3	7.55
So.Chicago,Ill. R2	7.05
Struthers,O. Y1	7.05
Youngstown R2	7.05

RIVETS

F.o.b. Cleveland, and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 8.90c
⅞-in. under ..... 26.5 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..... List

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants, per cent off list for less than case lots to consumers)

6 in. and shorter:	
½-in. & smaller diam.	4
⅝-in. & ⅝-in.	5
¾-in. and larger	3
Longer than 6 in.:	
All diams.	+4
Lag bolts, all diams.:	
6 in. and shorter	12
Over 6 in. long	8
Ribbed Necked Carriage	5
Blank	25
Plow	25
Step, Elevator, Tap and Sleigh Shoe	12
Tire Bolts	List
Boiler & Fitting-Up Bolts	23

NUTS

H.P. & C.P., regular & heavy:	
Square, all sizes	58
H.P., Hex, regular & heavy:	
¾" and smaller	58
⅞" to 1⅜", inclusive	60
1⅜" to 1½", inclusive	62
1⅝" and larger	58
C.P. Hex, regular heavy:	
All sizes	58
Hot Galv. Nuts (all types):	
¼" and smaller	40
⅝" to 1½", inclusive	43
Finished Hex Nuts:	
New standard, all sizes	58
Semifinished & Slotted Hex Regular and heavy, all sizes	58

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	34
1 in. and smaller diam. x over 6 in.	20

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	31
¼-in. diam. & larger	14
N.F. thread, all diams.	8

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	47.5 & 10
Plated finishes	30 x 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:	
⅝-in. & smaller	38
¾-in. through 1 in.	22
Longer than 6 in.:	
⅝-in. and smaller	20
¾-in. through 1 in.	7

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98.6% Fe, annealed	18.00
Unannealed	14.50
Swedish, c.l., N.Y., c.l., in bags	11.25
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99+% Fe)	36.50
Unannealed (99+% Fe) (minus 325 mesh)	53.50
Powder Flakes (minus 16, plus 100 mesh)	*41.00*
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb drums, freight allowed	
Carlots	*41.00*
Ton lots	*44.00*
Intimary, 500 lb lots	*82.00**
Brass, 20 ton lots	*29.25-36.50*
Bronze, 10-ton lots	51.00-60.00
Copper:	
Electrolytic	*14.50**
Reduced	*14.50**
Lead	*7.50**
Magnesium	75.00-85.00
Manganese:	
Minus 48 mesh	*61.00*
Minus 100 mesh	*62.00*
Minus 200 mesh	*72.00*
Nickel unannealed	89.50
Nickel-Silver 5-ton lots	47.00
Silicon	*43.50*
Solder	8.50*
Stainless Steel, 302	91.00
Tin	14.00*
Zinc, 10-ton lots	17.50-25.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.35
Less than 1000 lb	5.50
Chromium electrolytic *99.9% Cr min.*	*1.60*

*Plus cost of metal

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅜" to 1 7/16", 1 7/16" to 1 15/16" 4.85c; 1 15/16" to 2 5/16" 4.95c.
(6) Chicago or Birm. base.
(7) To jobbers, 5 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 7.85c.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only, 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for unfreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing mill lengths, to fabricators; to consumers, 5.40c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; add 0.35c for universal mill.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 12 gage & slighter, 60" & narrower.
(38) 14 gage & lighter 48" and narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(48) 0.7 gage.
(49) U post, add 2 cols. for T post.

STAINLESS STEEL MILL PRICES

(Representative prices, cents per pound; subject to current lists of extras)

AISI Type	Rerolling Ingots	Rerolling Slabs, Billets	Forging Billets	Seamless Tube Billets	Shapes; H.R. Strip	Shapes; H.R. & C.F. Bars; Wire	Plates	Sheets	C.R. Strip, Flat Wire
301	16.25	20.50	29.50	34.25	29.75	35.25	37.25	46.25	38.25
302	17.25	22.75	29.75	34.50	32.00	35.50	37.50	46.50	41.50
302B	18.50	24.50	30.50	34.50	35.00	35.50	37.50	48.75	44.75
303	18.75	24.75	32.25	37.25	36.75	38.25	39.75	48.75	45.50
304	18.25	23.75	31.00	36.00	34.25	37.25	39.75	48.75	43.75
304L	....	....	36.75	....	....	42.75	45.25	54.25	49.00
306	19.50	25.50	....	36.25	37.00	37.50	42.00	51.75	46.75
308	19.75	26.25	35.25	40.75	38.00	42.00	46.00	55.25	48.00
309	26.50	34.75	43.25	49.25	49.25	50.50	53.75	63.50	62.00
309S	28.50	37.50	47.50	54.50	54.00	55.50	59.00	68.50	68.50
310	33.00	43.25	56.75	66.25	67.50	67.50	69.00	72.25	78.75
314	....	....	....	....	....	....	69.00	74.50	....
316	28.00	36.25	46.75	54.50	55.00	55.50	59.00	64.50	66.50
316L	....	....	52.50	....	....	61.00	64.25	70.00	72.00
317	33.00	43.50	58.25	66.75	67.50	68.25	70.75	77.00	79.25
318	33.50	44.00	55.25	64.50	66.25	65.50	68.75	78.00	80.25
321	22.75	29.50	35.25	40.75	42.00	42.00	46.00	55.50	54.50
330	....	....	58.00	....	....	68.50	70.00	73.75	77.75
347	24.50	32.25	39.50	45.75	46.50	46.75	51.25	60.75	59.25
403	....	....	27.00	30.75	....	32.00	34.25	44.00	41.25
405	16.50	21.75	25.25	29.25	30.50	30.25	31.75	42.50	39.75
410	14.00	18.25	24.00	27.75	26.25	28.75	30.00	40.75	34.25
416	....	....	24.50	28.25	....	29.25	30.50	41.25	41.25
420	22.00	28.50	29.25	34.00	35.50	35.00	38.50	49.25	52.75
430	14.25	18.50	24.50	28.25	27.00	29.25	30.50	43.50	34.75
430F	....	18.75	25.00	28.75	....	29.75	31.00	44.00	44.00
431	14.50	28.50	25.00	28.25	27.50	29.25	30.50	44.00	35.25
440A,B,C	....	28.50	29.25	34.00	....	35.00	38.50	49.25	52.75
442	....	....	28.00	....	....	30.50	35.25	48.25	47.75
446	....	....	33.75	38.25	53.00	39.50	40.75	59.75	71.00
501	....	....	14.00	14.50	21.25	16.00	18.25	30.50	29.00
502	....	....	15.25	16.00	22.25	17.00	20.00	31.75	30.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co., Sharon Steel Corp.; Shenango Agaloy Tube Co.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

CLAD STEEL

Cladding Stainless	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%	Sheets: Copper Base Both Sides
302	....	31.00	31.00	77.00
304	27.60	32.50-32.70	32.50	77.00
310	36.50	41.00	.....	144.00
316	32.60	37.70-42.75	42.75	....
318	37.00	42.20	.....	....
321	29.30	34.40-37.00	37.00	111.00
347	30.40	35.50-40.50	40.50	130.00
405	23.40	30.60	.....	....
410	22.90	30.10	.....	....
430	22.90	30.10	.....	....
Inconel	41.23	54.18	.....	165.00
Nickel	37.50	50.90	.....	....
Monel	35.90	51.80	.....	....
Copper*	....	.....	46.00	....

	Strip, Carbon Base: Cold-Rolled 10%	Cold-Rolled Both Sides	Hot-Rolled 10%	Hot-Rolled Both Sides
Copper*	27.85	35.85	24.00	32.25

*Deoxidized. Production points: Stainless sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates Coatesville L7; copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

TOOL STEEL

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.25-.285	5% Cr Hot Work	0.39
Extra Carbon	0.33-.340	W-Cr Hot Work	0.41
Special Carbon	0.33-.360	V-Cr Hot Work	0.43
Oil Hardening	0.370-.39	Hi-Carbon-Cr.	0.665-.70

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	...	.....	4.055
18.25	4.25	1	4.75	...	.....	2.340
18	4	2	9	...	.....	2.565-2.695
18	4	2	....	...	.....	1.820
18	4	1	....	...	.....	1.580-1.660
13.5	4	3	....	...	.....	1.875
6.4	4.5	1.9	....	5	.....	1.065
6	4	3	....	6	.....	1.300
2	1.4	1.2	....	...	.....	0.495
1.5	4	1	....	8.5	.....	0.895

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

PIG IRON, Gross Ton

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Alabama City R2	52.38	52.88	....	....
Birmingham R2	52.38	52.88	....	....
Birmingham U6	....	52.88	....	....
Woodward, Ala. W15	52.38	52.88	....	....
Cincinnati, deld.	....	60.43	....	....
Buffalo District				
Buffalo R2, H1	56.00	56.50	57.00	....
Tonawanda, N.Y. W12	56.00	56.50	57.00	....
No. Tonawanda, N.Y. T9	....	56.50	57.00	....
Boston, deld.	66.65	67.15	67.65	....
Rochester, N.Y., deld.	59.02	59.52	60.02	....
Syracuse, N.Y., deld.	60.12	60.62	61.12	....
Chicago District				
Chicago I-3	56.00	56.50	56.50	57.00
Gary, Ind. U5	56.00	....	56.50	....
Indiana Harbor, Ind. I-2	56.00	....	56.50	....
So. Chicago, Ill. W14, Y1	56.00	56.50	56.50	....
So. Chicago, Ill. U5	56.00	....	56.50	57.00
Milwaukee, deld.	58.17	58.67	58.67	59.17
Muskegon, Mich., deld.	....	62.80	62.80	....
Cleveland District				
Cleveland A7	56.00	56.50	56.50	57.00
Cleveland R2	56.00	56.50	56.50	....
Akron, O., deld. from Cleve.	58.75	59.25	59.25	59.75
Lorain, O. N3	56.00	....	....	57.00
Mid-Atlantic District				
Bethlehem, Pa. B2	58.00	58.50	59.00	59.50
New York, deld.	....	62.28	62.28	....
Newark, deld.	61.02	61.52	62.02	62.52
Philadelphia, deld.	60.75	61.25	61.75	62.25
Birdsboro, Pa. B10	58.00	58.50	....	....
Steelton, Pa. B2	58.00	58.50	59.00	59.50
Swedeland, Pa. A3	58.00	58.50	59.00	59.50
Troy, N.Y. R2	58.00	58.50	59.00	....
Pittsburgh District				
Neville Island, Pa. P6	56.00	56.50	56.50	....
Pittsburgh (N&S sides), Ambridge, Aliquippa, deld.	57.37	57.87	57.87	....
McKees Rocks, deld.	57.04	57.54	57.54	....
Lawrenceville, Homestead, Wilmerding, Monaca, deld.	57.66	58.16	58.16	....
Verona, Trafford, deld.	58.19	58.69	58.69	....
Brackenridge, deld.	58.15	58.65	58.65	....
Bessemer, Pa. U5	56.00	....	56.50	57.00
Clairton, Rankin, So. Duquesne, Pa. U5	56.00	....	....	....
McKeesport, Pa. N3	56.00	....	....	57.00
Midland, Pa. C18	56.00	....	....	....
Monessen, Pa. P7	56.00	....	....	....
Youngstown District				
Hubbard, O. Y1	....	....	56.50	....
Sharpsville, Pa. S6	56.00	56.50	56.50	57.00
Youngstown Y1	....	....	56.50	57.00
Youngstown U5	56.00	....	....	57.00
Mansfield, O., deld.	60.90	....	61.40	61.90
Duluth I-3	56.00	56.50	56.50	57.00
Erie, Pa. I-3	56.00	56.50	56.50	57.00
Everett, Mass. E1	59.50	63.00	63.50	....
Fontana, Calif. K1	62.00	62.50	....	....
Geneva, Utah C11	56.00	56.50	....	....
Granite City, Ill. G4	57.90	58.40	58.90	....
Ironton, Utah C11	56.00	56.50	....	....
Lone Star, Texas L6	52.00	52.50*	52.50	....
Minnequa, Colo. C10	58.00	59.00	59.00	....
Rockwood, Tenn. T3	....	....	56.50	....
Toledo, O. I-3	56.00	56.50	56.50	57.00
Cincinnati, deld.	61.76	62.26	....	....

*Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si; 75 cents for each 0.5% Mn over 1%)

Jackson, O. G2, J1	$67.00
Buffalo H1	68.25

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

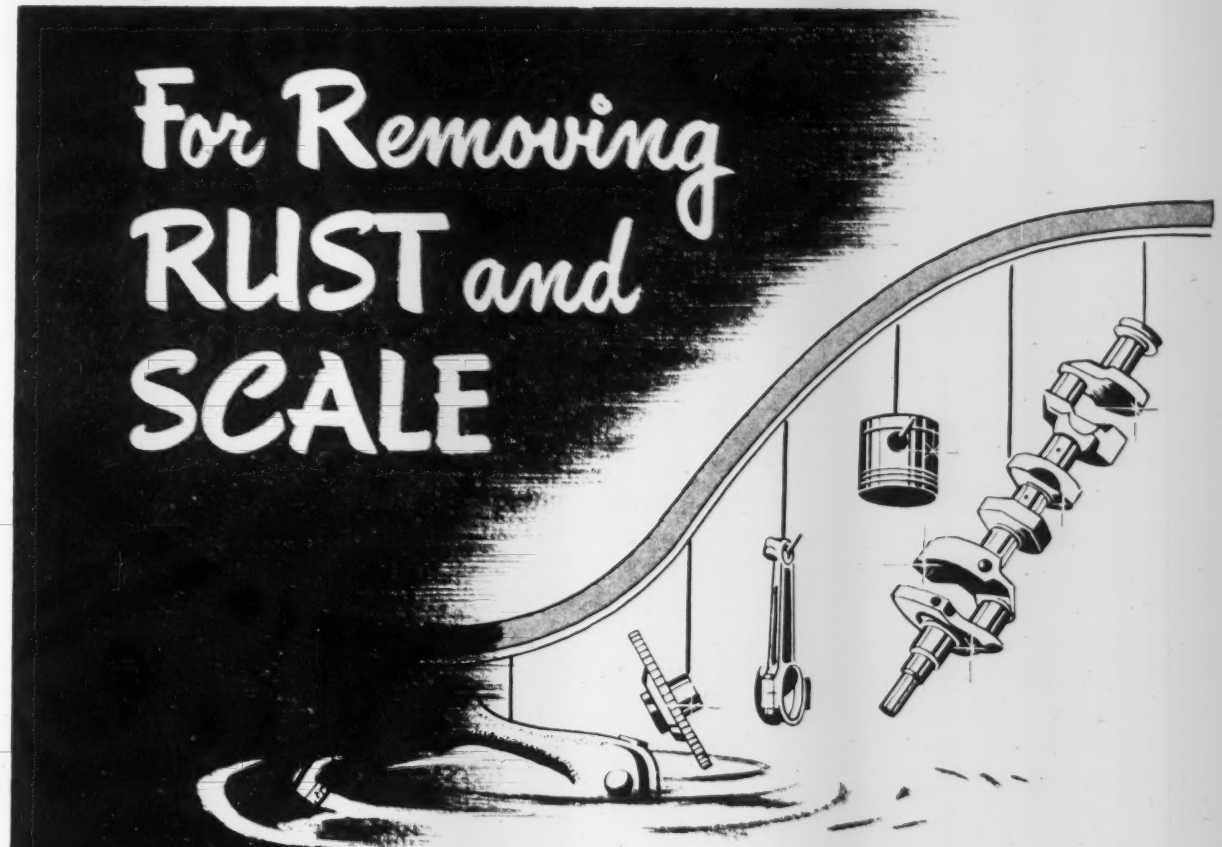
(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.45 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls, N.Y. P15	$91.00
Keokuk, Iowa, Openhearth & Fdry., freight allowed K2	95.50
Keokuk, OH & Fdry. 12½ lb piglets, 16% Si, frt. allowed K2	98.50
Wenatchee, Wash. OH & Fdry., freight allowed K2	95.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$61.00
Rockwood, Tenn. T3	70.00
Steelton, Pa. B2	64.00
Philadelphia, deld.	67.55
Troy, N.Y. R2	64.00

For Removing RUST and SCALE



"ALKA-DEOX" DERUSTING PROCESS — An alkaline electrolytic process for rapid, removal of rust and scale from steel, cast iron and malleable iron. Operates at room temperature. No attack on basis metal. Uses Enthone Compound 134.

"COMPOUND 42" — CLEANER AND RUST REMOVER FOR STEEL. A solvent acid cleaner for rapid removal of oil, rust and oxide from steel, zinc, aluminum and other metals to prepare them for painting or organic finishing.

"DESCALER 2A" — POWDERED ACID PICKLING COMPOUND. A powdered acidic compound added to water to make pickling solutions for iron and steel. Safer to handle than sulphuric acid. Gives controlled acidity to prevent overpickling.

"ACTANE 33" — POWDERED COMPOUND REPLACES HYDROFLUORIC ACID. A dispersing agent added to acid pickles to remove colloidal and siliceous films from metals. Also an additive for sulphuric and nitric acid pickles to promote faster pickling of stainless steel, aluminum and titanium.

"ACID ADDITION AGENT" — STOPS ACID FUMES. A surface active material extensively used in acid pickles to reduce fuming, to give better wetting and to promote better pickling.

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	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	Hot Rolled	Cold Rolled	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.‡	H.R. Alloy 4140††§		Carbon	Floor
Baltimore	6.20	7.64	7.78	7.60	...	6.86	8.17¶	12.04	6.98	6.85	7.98
Birmingham	6.10	7.00	8.00¶	6.30	...	6.15	8.90	....	6.35	6.35	8.65
Boston	6.89	7.83	9.18	7.13	...	6.87	8.35	12.28	7.06	7.13	8.26
Buffalo	6.18	7.15	8.96	6.79	...	6.35	7.70	12.17	6.56	6.68	7.88
Charlotte, N. C.	6.95	7.80	8.69	6.90	...	7.10	8.37	....	7.10	7.10	8.27
Chicago	6.18	7.12	8.00	6.42	...	6.28	7.30	11.75	6.46	6.33	7.44
Cincinnati	6.51	7.19	8.42	6.72	...	6.58	7.66	12.17	6.93	6.80	7.88
Cleveland	6.18	7.12	7.90	6.58	...	6.34	7.65	11.89	6.78	6.50	7.79
Detroit	6.38	7.41	8.29	6.71	7.36	6.56	7.60	11.92	6.93	6.80	7.80
Erie, Pa.	6.19	7.12	9.01	6.54	...	6.28	7.65	....	6.56	6.50	7.79
Houston	7.15	7.60	9.40	7.45	...	7.45	....	....	7.35	7.20	8.55
Jersey City, N. J.	6.54	7.45	8.42	6.82	...	6.75	8.43¶	11.84	6.50	6.67	8.01
Los Angeles	7.25	9.00	9.35	7.55	11.20	7.15	9.10	13.05	7.35	7.20	9.25
Milwaukee	6.35	7.29	8.17	6.59	...	6.45	7.57	11.92	6.63	6.50	7.63
Moline, Ill.	6.53	7.47	8.35	6.77	...	6.63	7.65	....	6.81	6.68	...
New York	6.54	7.45	8.42	6.82	...	6.75	8.43¶	11.84	6.50	6.67	8.01
Newark, N. J.	6.78	7.75	8.42	7.16	...	7.06	8.43¶	....	6.90	6.99	8.30
Norfolk, Va.	6.90	....	....	7.20	...	7.20	8.50	....	7.20	7.15	7.85
Philadelphia	6.17	7.13	7.91	7.02	8.80	6.87	8.19¶	11.89	6.67	6.63	7.65
Pittsburgh	6.18	7.12	8.30	6.55	...	6.28	7.65	11.89	6.46	6.33	7.46
Portland, Oreg.	8.15	8.70	9.40	7.90	...	7.60	10.65	....	7.50	7.56	9.40
Richmond, Va.	6.50	7.45	8.00	7.10	...	7.05	7.95	....	7.10	6.85	8.10
St. Louis	6.48	7.42	8.30	6.72	...	6.58	7.70	12.05	6.86	6.73	7.86
St. Paul	6.84	7.78	8.66	7.08	...	6.94	8.06	....	7.12	6.99	8.12
San Francisco	7.35	8.70	10.15	7.60	...	7.15	9.75	13.05	7.25	7.20	9.25
Seattle	8.15	9.50	9.80	8.00	...	7.60	10.65	13.50	7.50	7.60	9.40
Spokane	8.15	9.40†	9.80	7.60	...	7.60	10.55¶	14.15	7.25	7.35	9.80
Washington	6.71	8.15	8.35	7.51	....	7.37	8.43	....	7.49	7.36	8.49

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes 35-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, and cold-finished bars, 2000 lb and over, except in Seattle where base is 2000 to 9999 lb and in Erie where base is 1000 lb and over; ¶—500 to 9999 lb; ‖—1000 to 1999 lb; #—1000 lb and over; †—1500 lb to 3999; ‡—under ½ in.

Demand for Warehouse Steel Eases

Seasonal factors, including slackening in manufacturing operations over holidays and yearend inventory considerations, tend to restrict volume of business

Philadelphia Recent weakness in sheets in the local warehouse market has resulted in a drop by leading distributors of 36 points in hot-rolled sheets to 6.17c, 42 points on cold-rolled sheets to 7.13c, and 50 points on galvanized sheets to 7.91c.

Prices on other products are unchanged and in general demand is being fairly sustained at present.

Pittsburgh Warehouse customers are doing little forward buying. Sales are spotty but are expected to improve early next year. Distributors' stocks are in better shape than they were most of this year. Structural shapes, especially wide flange beams, and light plates remain tight. Freight absorption is taking place in fringe areas.

Cleveland District warehouse operators are booking orders in fair volume but demand is noticeably off. November volume was reported by some sellers as about up to the monthly average for the year. Expectations are December volume will be down in view of anticipated further slackening in manufacturing operations over the holidays. Seasonal inventory-taking also is seen as contributing to an easing in demand pressure. Competition for orders is keener and some price concessions in the way of freight absorption are reported.

Chicago Steel warehouses are close to an inventory position that is about 80 per cent of normal. Current effort is toward rounding out of stocks both as to sizes and specifications. Wide flange structurals remain short but plates no longer are a difficulty. For the first time in a long while warehouses can be selective in choosing from what mills have to offer. December business is expected to continue about as is.

Boston Warehouse inventories will be in normal balance by January, an exception being wide flange shapes. Volume is sloughing off this month. With year-end inventory a factor, consumers are buying only short items to maintain production.

In dollar volume most distributors will better last year by about 10 per cent despite slackening in the second half.

On some products warehouses are

STEEL IMPORT PRICES

(Base, per 100 lb, landed, duty paid)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$4.65	$4.75	$4.85	$4.90
Bar Size Angles	4.30	4.40	4.30	4.55
Structural Angles	4.30	4.40	4.30	4.55
I-Beams	4.30	4.40	4.30	4.55
Wide Flange Beams	4.94	5.03	4.94	5.23
Sheet and Plate, 10 gage, 11 gage, 5' x 10'	5.87	5.95	5.87	6.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.50	25.70	25.50	28.34
Barbed Wire	6.20	6.30	6.20	6.45
Merchant Bars	4.55	4.65	4.55	4.83
Hot Rolled Bands	4.65	4.75	4.65	4.93
Wire Rods, Thomas Commercial No. 5	4.65	4.75	4.73	5.00
Wire Rods, O-H, Cold Heading Quality No. 5	5.14	5.21	5.19	5.48
Channels	4.40	4.50	4.40	4.68
Bright Common Wire Nails, 8d	6.55	6.65	6.60	6.85

Size O.D.	Wgt/Foot/Lb	Gulf Port	West Coast	Vancouver
Seamless A.P.I. Casing, Grade J-55:				
5½ in.	15.5	$1.47/ft	$1.51/ft	$1.33/ft
7 in.	23	2.10/ft	2.17/ft	1.90/ft
Seamless N-80 Casing:				
5½ in.	17	1.94/ft	2.00/ft	1.75/ft
7 in.	23	2.60/ft	2.70/ft	2.36/ft
Seamless J-55 Tubing:				
2⅜ in.	4.7	0.60/ft	0.63/ft	0.55/ft
2⅞ in.	6.5	0.80/ft	0.83/ft	0.73/ft

Sources of shipment: Western continental European (Schuman Plan) countries.

somewhat long, including merchant pipe, small carbon bars, galvanized sheets and wire goods.

Cincinnati—Lack of buying interest is hitting warehouses in this area. One distributor says November was a bad month "the worst yet".

This seller called up one customer who reported his backlog of orders 90 days ago was 6 months but has now slipped to 6 weeks. Result: The customer is buying just what he has to have and that's all. A second warehouseman estimated his business last month was down 20 per cent from October. Stainless items have been selling well.

Los Angeles—With mill deliveries getting more current, and consumer demand weaker, major problem facing distributors is keeping close-to-normal inventories from growing larger and unbalanced. Warehouses have an excess of bars, bar-sized structural shapes, and not enough of wide-flange beams and plates.

San Francisco—Warehouse business is houlding up. Demand is not as urgent, but it is broader. With better supply this makes for a steady volume. Still in short supply are heavy plates and structurals. There also is a pinch in angle structurals due to the long shutdown of Pacific States Steel Corp. because of labor difficulties.

Seattle—Warehouse demand is spotty but business compares well with that of other years at this slow season. In many instances large consumers are postponing purchases until inventories are reduced.

Plates are still on allocation, but Geneva Works is expected to be on a current basis by January.

Wire . . .

Wire Prices, Page 244

Boston—Distributors of cold-headed products are saddling producers with higher inventories for stock shipments. They, at the same time, are working down stocks. This is holding back some orders for cold-heading wire. Not much volume has been placed beyond January.

Screw production is 20 to 25 per cent below December, 1952. Except for limited exceptions in high carbon specialties, wire bookings are light. Automotive orders are perking up.

Pittsburgh—Merchant wire sales are depressed, but manufacturers wire is slowly recovering from effects of inventory cutbacks. Most consumers have worked through inventories and are returning to the market for small purchases

Sheetmakers Await Buying Pickup

Producers optimistic for first quarter despite current sluggish covering for the period by consumers. Sharper competitive situation gives rise to freight absorption

Sheet and Strip Prices, Page 242 & 243

Chicago—Continental Steel Corp., Kokomo, Ind., is offering for sale 19-gage and lighter hot-rolled sheets and has established a base price of $5.025 per 100 pounds, f. o. b. Kokomo. The company has adopted new extras to apply on 19-gage hot-rolled base which will result in item prices of 10 cents per 100 pounds under published cold-rolled sheets for comparable gages, sizes and quantities.

Cleveland—Although consumers have been displaying an unusual degree of caution in placing orders for first quarter, sheetmakers anticipate they will be well booked for the period. While they have open spaces in schedules for the first three months of the year they are not particularly concerned over the current slack demand, since it, in some measure, is attributed to the approach of the holidays and inventory-taking time. While competition for business is keen among the separate producers, except for freight absorption, no sign of price cutting is seen.

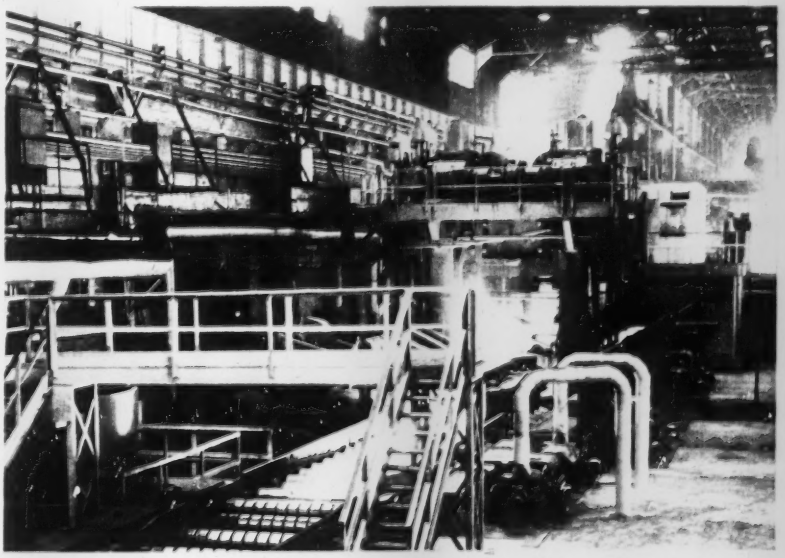
Boston—New cold-rolled strip orders are for prompt delivery, fill-in requirements into January. Beyond that month consumers are buying cautiously. With shipments close to 60 days on most strip grades, few users are placing production orders for first quarter needs until after Jan. 1.

Except for some specialties, strip converters are well fixed on hot-rolled tonnage. Volume of cold-rolled sheet tonnage offered for first quarter is heaviest in years and selling is competitive.

New York—Although sheets are in easy supply, most sellers are optimistic for first quarter. By that time they believe the automotive industry will resume buying on a major scale and that other consumers who have been working off inventories will again be showing interest.

Some sheet sellers report a tightening up in galvanized sheet supply. Not too long ago it was perhaps the most sluggish of the major light flat items.

Philadelphia—Sheet and strip producers still have open capacity for January on all grades and competi-



Inland Boosts Capacity of Blooming Mill

A giant new blooming mill which rolls steel ingots to smaller sizes was installed recently at Inland Steel Co.'s Indiana Harbor, Ind., Works. Modernization of the mill, raising its rating from 40 in. to 46 in., was accomplished in only 23 days with minimum loss of production. Upon completion of program to enlarge auxiliary equipment, mill will have 25 per cent more capacity than its predecessor

tion for orders is keen. However, competition among producers so far has been confined principally to freight absorption and has not resulted in cuts in base prices.

While anticipating no improvement in demand over remainder of the year, producers are still looking forward to a good first quarter, although it likely will be off from the corresponding period last year.

Alan Wood Steel Co., Conshohocken, Pa., has placed 500 tons of shapes for construction of a 30-inch cold strip mill.

Pittsburgh—Orders for hot-rolled sheets continue to drop, but long-term views are optimistic. Producers expect increased orders for cold-rolled from automakers in January and February. Operations for December will probably drop below November.

Oakland, Calif.—Kaiser Steel Corp. has reduced the domestic f. o. b. mill base price of its "Kaisaloy" hot-rolled sheets to $6.675 per 100 pounds from $7.00.

Steel Bars . . .

Bar Prices, Page 242

Cleveland—First reaction to Republic Steel Corp.'s announcement of a new method of quoting delivered prices on hot-rolled bars was favorable. Other makers have not indicated as yet whether they will follow Republic's lead but, since Republic's new pricing method doesn't go into effect until Dec. 15, it is likely other producers will hold off for some weeks before formally making their position known.

In the meantime, it is understood consumer reaction is favorable. In some consumer circles the new bar pricing method is said to have generated thinking with respect to possibly working out a similar method for pricing certain types of goods sold on a quantity rather than a piece basis.

Boston—Bar users see no serious procurement problem ahead in either carbon or alloy grades during first quarter. While consumption is likely to be heavier, so also will be tonnage available.

Price equalization is spreading on spot orders for prompt shipment, and, while volume placed for first quarter is light, with openings in January, every ton of steel bought during the next three months will involve competition.

New York—Supply and demand for hot carbon bars are in as close balance as they have been in recent years. Sellers will enter the new

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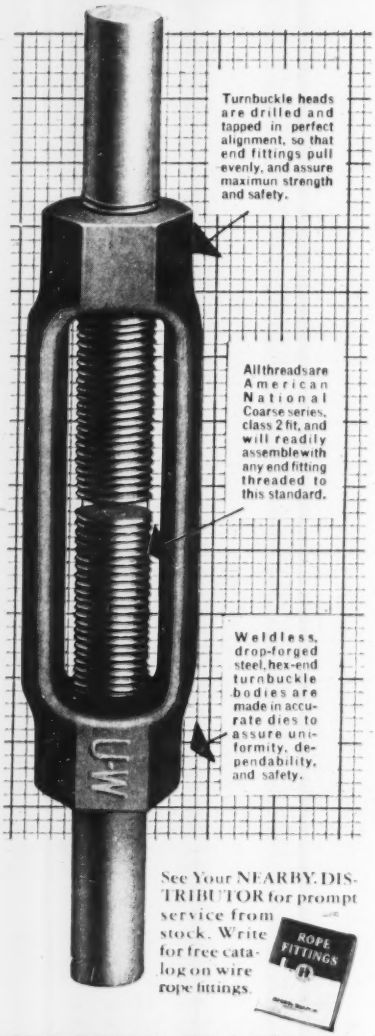

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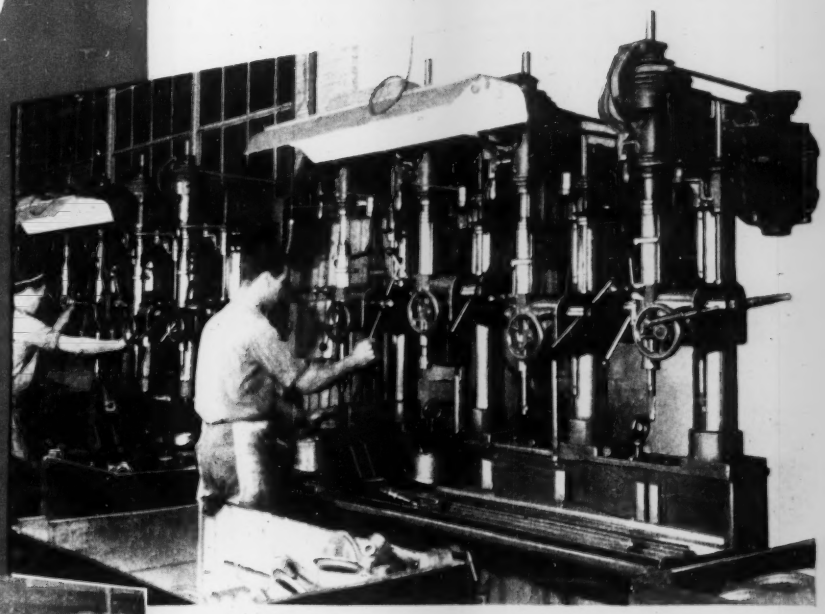

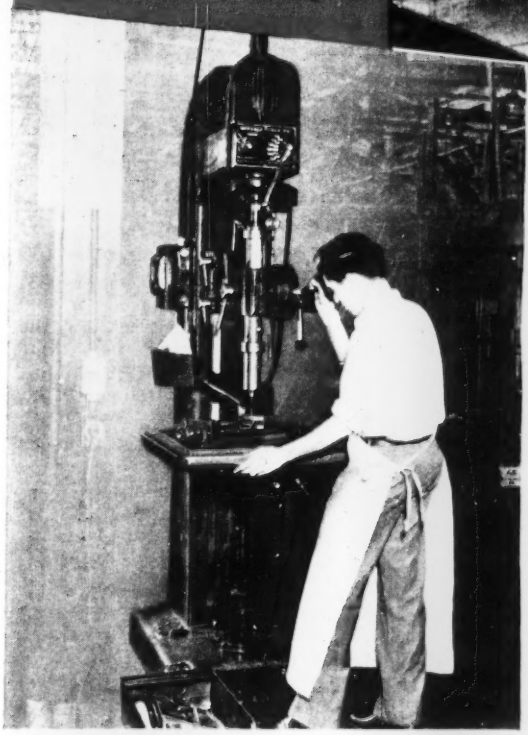

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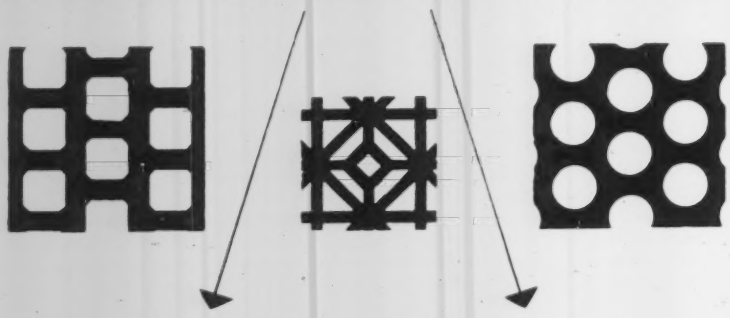

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year without important carryovers. Bookings for January are becoming somewhat accelerated, but there is not much consumer interest in positions beyond that month. Sellers of cold drawn carbon bars report sluggish demand. Some still have tonnage available for delivery this year.

Philadelphia — Hot-rolled carbon bar producers will enter the new year with little or nothing in the way of arrearages and with the outlook none too lively for at least a few weeks. Some mills doubt if there will be any sharp pickup in demand before February, and are not too sure as to the extent of such improvement even then.

Pittsburgh — January orders do not yet reflect an increase from December volume, although barmakers expect to increase sales to auto producers in first quarter. While most consumers have worked through inventory reductions, warehouses are cutting purchases of cold-finished bars. Stocks are well rounded.

Los Angeles — With bar demand weaker, Bethlehem Pacific Coast Steel Corp. reduced its number of active electric furnaces from 3 to 2, and reduced number of working days from 7 to 4.

Semifinished Steel . . .

Semifinished Prices, Page 242

Chicago — District ingot output last week was at 96 per cent of capacity, down one-half point from the revised rate of the preceding week and the lowest since the 94.5 per cent rate reported the last week in August when a major producer idled an open-hearth shop for repairs.

The lower ingot rate reflects softer demand for steel but against this picture for the district is announcement of Inland Steel Co. that its operations for last week were at 105 per cent of capacity compared with 104.9 and 101.1 per cent in the two preceding weeks.

Inland Steel's sales vice president, John F. Smith Jr. states that its production should be at or near capacity for the balance of 1953 and first quarter of 1954.

Youngstown — District steel operating rate has declined a few more points to 90 per cent of capacity. Three bessemer converters, 61 open hearths, and 23 blast furnaces are operating.

Republic Steel Corp. took off two open hearths, and U. S. Steel Corp. took off one more at its Ohio works, but added a turn weekly at its bessemer converters. Youngstown Sheet & Tube Co. added an open hearth.

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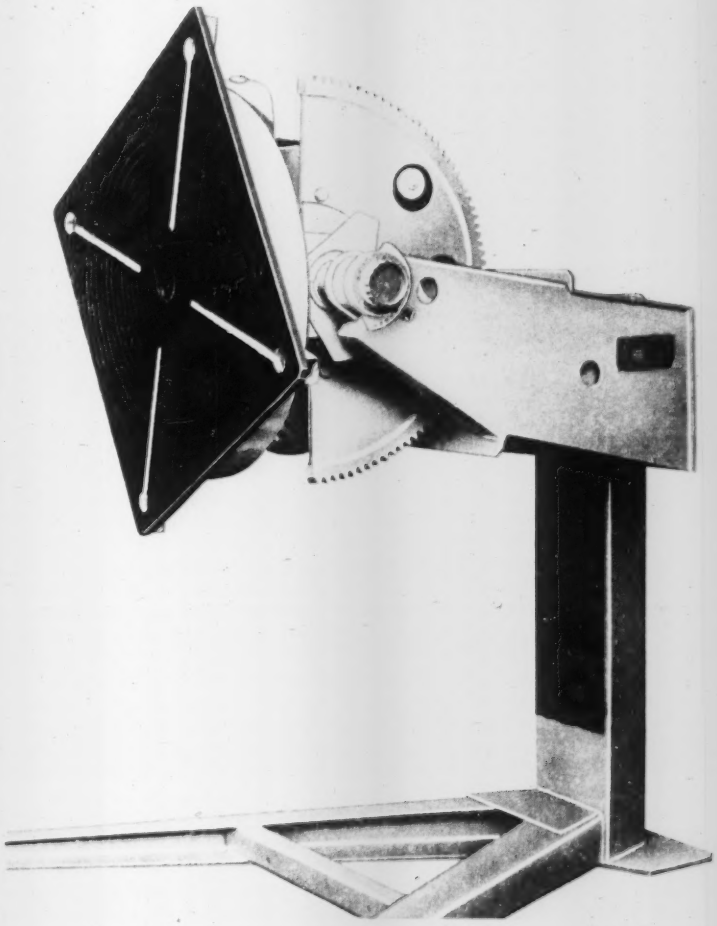

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Plates . . .

Plate Prices, Page 242

Philadelphia Plates are moving better than other flat-rolled products but there is substantial room for improvement with January capacity available. No one mill has a full order book for that period. Dip in demand from fabricators of light oil storage tanks contributes to the lag. Structural fabricators have ample tonnage in hand.

Lukens Steel Co., Coatesville, Pa., reduced prices on carbon steel plates $3 per ton and on alloy steel plates $4 per ton. The new prices are $1.20 per 100 pounds for carbon plates against $1.35 previously, and $5.55 for alloy plates against $5.75 heretofore. Extras remain unchanged.

The Claymont, Del., mill of Colorado Fuel & Iron Corp. is meeting the Coatesville, Pa., competition with a reduction of $3 per ton on carbon plates and $2 on alloy plates, effective Dec. 2. Further price adjustments in the eastern plate market are expected. Claymont now quotes carbon plates 4.20c, and alloy plates, 5.55c.

Boston Plate demand has eased, but not to the extent producers are willing to absorb freight to get business at least for January. Also, smaller premium prices are maintained. Most plate fabricating shops have lower backlogs and are covering only for January.

Whereas heavy, wide plates were tightest until last quarter, extremely wide and light-gage stock now occupies that spot.

New York Some January plate capacity is open. In general there will be little carryover from this year, except for a modest tonnage of light gage material. Plate makers anticipate a good first quarter, as consumer inventories are not excessive, in fact, stocks have been worked off to a point in various instances where a building up in inventories will likely take place after turn of the year.

Pittsburgh A large consumer of plates reports steady loosening in supply, with extra allotments available in December and prospects of improved delivery in January. Producers say demand, especially for light plates, remains strong.

Chicago Plate fabricators in this area no longer have plate supply difficulties but the easing hasn't extended yet to plants which they operate in the West and South. In midwestern and eastern areas the transition from shortage to sufficiency came with surprising rapidity.

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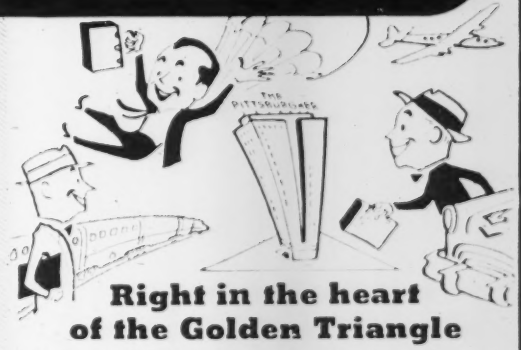

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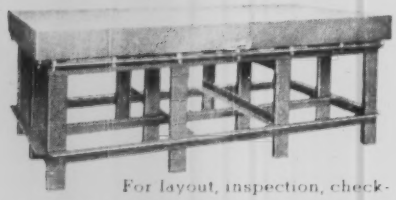

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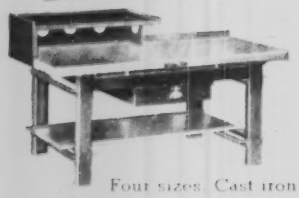

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General Catalog

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Full address

$8 million expansion program at the Fontana Works will increase output of plates and strip by 10,000 tons monthly, 5000 tons being for tin plate.

Seattle Unstated tonnage of plates is involved in several disposal tank projects at the Hanford Works.

Structural Shapes . . .

Structural Shape Prices, Page 242

Boston Structural fabricating shops will end the year with good backlogs, three-four months with district plants, larger units well into second quarter. New contracts are down slightly, but more work is being estimated with additional volume to be out early next year, notably bridges.

Less tonnage is being placed on fabricated delivery basis. There are few exceptions with price secondary, but for the most part competition is sharpening with steel in place quoted about 6 per cent below earlier peak.

New York While adverse seasonal influences are more pronounced, structural demand continues fairly active. Featuring awards are 5400 tons for the Uris Bros. office building, 300 Park Ave., this city. Inquiry includes 1900 tons for a New York state thruway bridge in Rockland county.

New York October structural bookings amounted to 191,180 tons, a decrease of 12 per cent from the previous month but up some 1 per cent over the corresponding month last year, reports the American Institute of Steel Construction. Total bookings for the first 10 months this year amounted to 2,429,371 tons, up 14 per cent from like 1952 period.

Shipments in October aggregated 289,755 tons, the highest figure reported since October, 1929, when 323,785 tons were shipped. Total shipments for the first 10 months this year were 2,587,237 tons, or at a rate of a possible 3 millions or better for the full year.

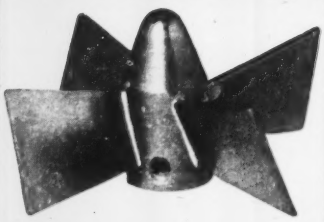
Order backlogs as of Oct. 31 amounted to 1,927,240 tons.

Philadelphia Some standard structural shapes can be had for next month, but wide flange schedules are fully booked. Plates are giving them little, if any trouble, and bars are plentiful.

Structural demand is tapering, but fabricators charge this off to seasonal influences.

Seattle Fabricators' backlogs are declining rapidly. However, there is a large number of jobs, public and private, pending. Steel supply is satisfactory except for wide flange sections.

Rocket Fuse



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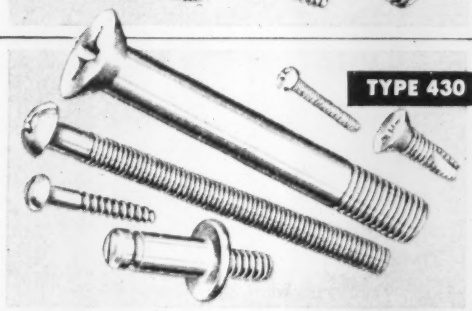
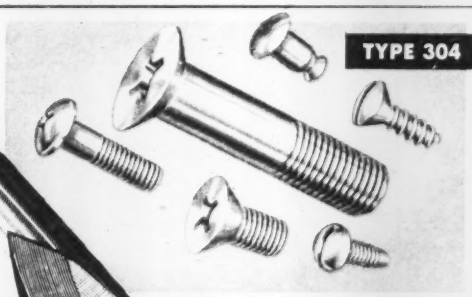
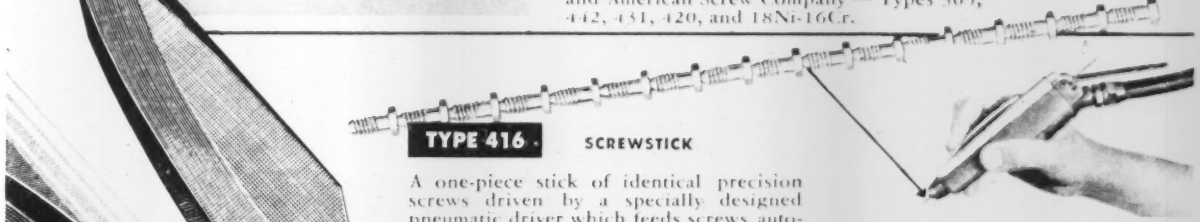
STAINLESS STEEL FASTENERS

	TYPES & CHARACTERISTICS	APPLICATIONS
TYPE 410	Self-Tapping Screws Wood and Machine Screws Used where high strength and moderate corrosion resistance are required	Automobiles, trucks Counter tops Metal storm sash, screens, awnings Railroad cars Refrigerators Stoves Washing machines
 **TYPE 430**	Wood and Machine Screws Self-Tapping Screws for special applications Used when good corrosion resistance is required	Appliances Automobiles, trucks Counter tops Metal storm sash, screens, awnings Refrigerators Stoves Washing machines
 **TYPE 304**	Wood and Machine Screws Aircraft Fasteners Self-Tapping Screws for special applications Used where excellent corrosion resistance, nonmagnetic and heat resistance are required	Aircraft Chemical processing equipment Counter tops Electrical and electronic equipment Kitchen and restaurant equipment Medical equipment Refrigerators Stoves

The following types can be furnished for specialized applications in cooperation with the engineering personnel of customers and American Screw Company — Types 305, 442, 451, 420, and 18Ni-16Cr.



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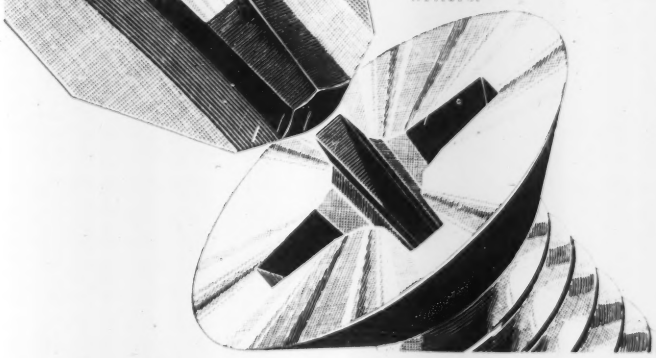

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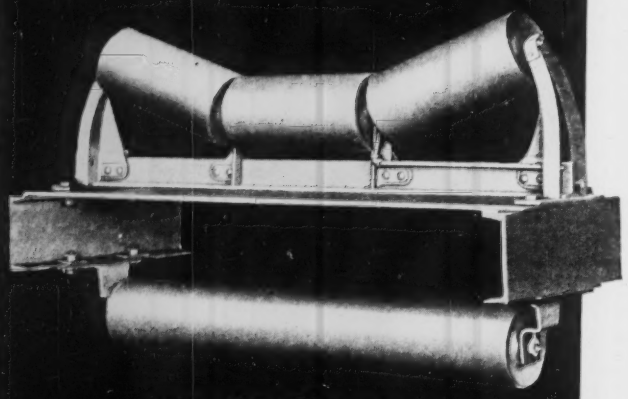

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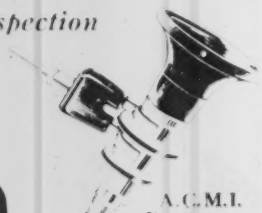

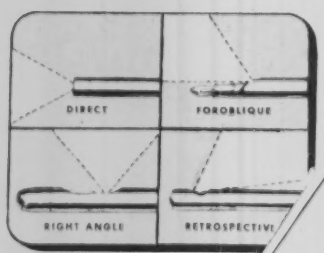

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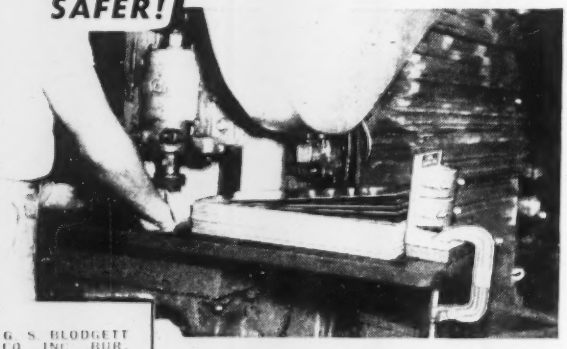

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WITH FOUR TIMES THE SPEED; ONE FOURTH THE DISTORTION

"Manual Lincolnweld's" high-current-density welding could solve your fabricating problem

THE PROBLEM: To fabricate a table 46" square calls for welding 1" plate, ribbed with 2" by ½" and 4" by ½" bar and channels from 3/16" plate. The hub is hot rolled bar and center ring is 6" by ¼" stock. With hand welding, distortion averaged ½" to ⅝".

LINCOLN'S ANSWER: High-current-density welding in agglomerated flux with "Manual Lincolnweld" at speeds 4 times that possible with hand welding using coated electrodes. Speed on ¼" fillets increased from 7" to 28" per minute.

THE RESULTS: Concentrating high welding currents on 5/64" electrode gives full penetration in one pass. Distortion is reduced from ⅝" to only ⅛". Welds are smooth, uniform and essentially self-cleaning, saving manhours in cleaning and finishing to cut shop production costs still further.

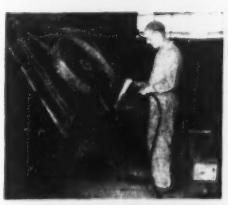

Fig. 1. Simpler to Fabricate. Positioner table is fillet welded with "Manual Lincolnweld's" hidden-arc welding in granular flux. Welding speed for ¼" fillet weld is 28" per minute. Photo courtesy Worthington Corporation, Plainfield, N. J.

Fig. 2. Rugged Welded-Steel Table is fabricated for less cost. Welds are smooth, uniform, ductile. Distortion is cut 75% over hand welding.

WHAT'S YOUR PROBLEM? Complete Automatic Service — machines, electrodes, engineering—is available at one source . . . Lincoln. Your nearest Lincoln representative can demonstrate the latest developments in hidden-arc welding to speed your production and cut shop costs.

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THE WORLD'S LARGEST MANUFACTURER OF ARC WELDING EQUIPMENT

Tubular Goods . . .

Tubular Goods Prices, Page 245

St. Louis Demand for tubular goods has taken a more than seasonal drop. Reduced construction is backing up inventories on jobbers' shelves. Pipe producers expect December shipments to be off 15 per cent from November.

First quarter ordering is cautious, with the last half not yet filled. Predictions are the quarter as a whole will hold to capacity operations, but nevertheless one interest has shut down one of four furnaces for lack of business.

Pittsburgh Consumers' stocks are well-filled, except in such oil country goods as casing and drill pipe. Little change is seen in the sales picture, which ranges from "very strong" in seamless pipe for oil country use to "good" in mechanical and pressure tubing and "fair" in standard seamless tubing.

Seattle Municipalities and other large buyers of cast iron pipe are awaiting 1954 budgets before placing orders for next year's supplies.

Pig Iron . . .

Pig Iron Prices, Page 246

New York Blast furnace output and rate of operations rose in October to the highest level since July, the American Iron & Steel Institute reports.

October output totaled 6,497,710 net tons, and the operating rate that month was 96.3 per cent of capacity. In September, the yield was 6,202,019 tons and the operating rate was 95.2 per cent.

The October output consisted of 6,419,752 tons of pig iron and 77,958 tons of ferroalloys.

Blast furnace production during the first ten months of 1953 totals 64,001,319 tons, compared with only 49,421,767 tons during the comparable period of strike-afflicted 1951. The 1953 figure consists of 63,275,079 tons of pig iron and 726,240 tons of ferroalloys.

A table of 1953 production follows:

BLAST FURNACE OUTPUT
(Net Tons)

1953	Pig Iron	Ferroalloys	Total
Jan.	6,482,081	82,302	6,564,383
Feb.	5,813,202	68,316	5,881,518
Mar.	6,611,040	66,321	6,677,361
Apr.	6,477,939	58,702	6,230,641
May	6,519,082	68,033	6,587,115
June	6,297,559	74,972	6,372,531
1st Half	37,894,903	418,646	38,313,549
July	6,436,345	80,142	6,516,487
Aug.	6,391,749	79,805	6,471,554
Sept.	6,132,330	69,689	6,202,019
Oct.	6,419,752	77,958	6,497,710
1952			
Oct.	6,442,024	73,067	6,515,091

New York Pig iron shipments this month will be off in this district. Some foundries are suspending iron ship-

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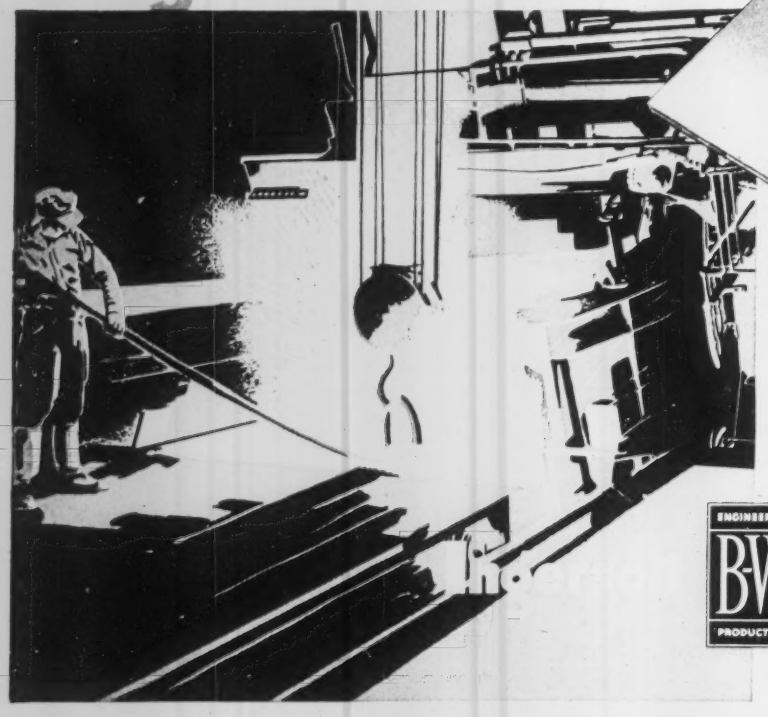

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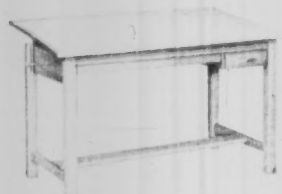

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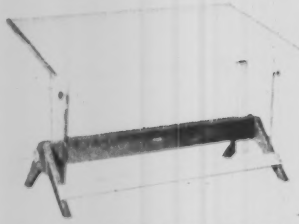

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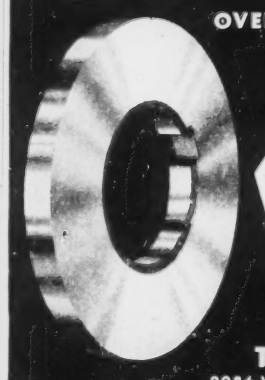

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ments during the final week of the year. Meanwhile, operations are lagging at around four days a week on an average. Sellers expect some gain in January.

Buffalo Pig iron production has slipped an additional 6 points, now averaging 78 per cent of capacity.

Philadelphia Trading in pig iron still lags with a further drop expected before an upturn sets in. Movement of iron should be particularly slack during the holidays.

Boston Available tonnage is well in excess of demand with consumers making no attempt to build inventories above current levels. Foundry and basic grades are in ample supply. Furnace stocks are expanding.

Pittsburgh Merchant pig iron shipments remain slow. No pickup is predicted before yearend. U. S. Steel Corp. blew in its No. 4 blast furnace at Duquesne, Pa. The furnace had been down for repairs since May.

Cleveland Not much change in the demand for merchant pig iron is expected over remainder of the year. Approaching holidays already are exerting the usual adverse influences and with consumers able to fill their iron requirements quickly they are not ordering aggressively for inventory.

Chicago Pig iron shipments during December are expected to parallel November performance. The total is substantially below first half year level, reflecting sharp reduction in demand for castings.

First quarter outlook remains a question mark. Automotive industry will be going well above current rate and there are prospects for an upsurge in farm machinery.

Scrap . . .

Scrap Prices, Page 268

Cleveland Definitely easier tone has developed in the scrap market here, especially on the steelmaking grades, prices on which are down another $1 per ton. This results largely from the holding up of shipments by a Valley mill which only within the past 10 days or so purchased for December shipment. Further, steelmaking operations are slumping noticeably, both in Cleveland and the Valley.

Boston Steelworks ingot rate fluctuations operate against further rising trend in steel scrap prices which have become more or less stabilized. No. 1 heavy melting volume is limited and that grade has not followed earlier advances while some reaction has taken place in No. 2 steel and bundles.

New York Scrap brokers have dropped prices on all steel grades, as a result of dull consumer demand, with some mills holding up shipments of tonnage on order. Traders declare they haven't witnessed such a profound lack of activity in recent years, although they ascribe the situation as being due in part to the approaching yearend inventory season.

Leading brokers are now offering to buy No. 1 heavy melting and No. 1 bundles at $24 to $25, No. 2 heavy melting at $21.50 to $22.50, and No. 2 bundles at $19.50 to $20.50, a drop of $3 per ton in each instance.

Machine shop turnings are off $2.50 a ton to $11 to $12, mixed borings and short turnings $3 to $15 to $16, low phos structural and plate $2 to $27.50, and short shovel turnings $3 to $16 to $17.

Cast grades are nominally unchanged with No. 1 cupola at $29 to $30, and unstripped motor blocks at $21 to $22.

Buffalo With a leading mill consumer informing dealers it will place no new business this month, the scrap market has weakened. Prices are off an average of $2 per ton for all items except cast. The latter is holding on new sales at prevailing quotations. Adding to the market gloom is extension of a shipping embargo by the area's largest mill.

Philadelphia The Fairless, Pa., producer has purchased a further but modest tonnage of No. 2 heavy melting steel at $32 delivered and No. 2 bundles at $30 delivered, both prices being unchanged from those paid by this consumer a few weeks ago.

The general tone of the steel scrap market is easy with buying generally quiet. Actually, there is not enough business to provide a real test of prices. Certainly this is true in the prime grades, such as No. 1 heavy melting steel, No. 1 bundles and No. 1 busheling. Prices of $35 delivered on these grades are purely nominal.

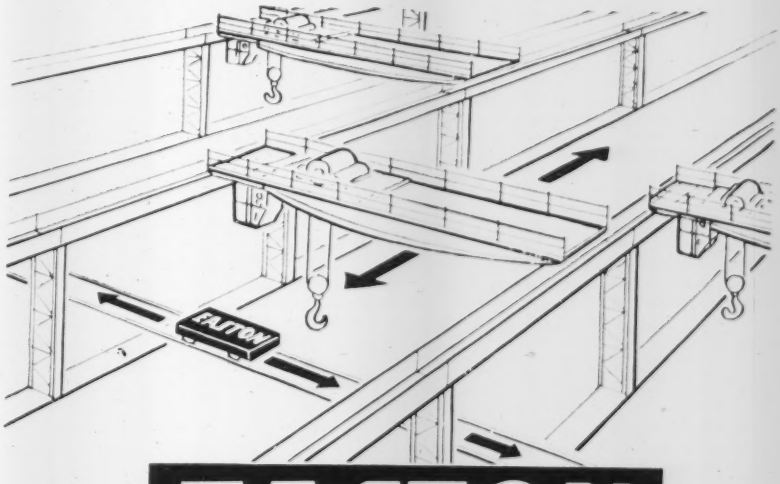
Pittsburgh Most scrap grades declined this week in a dull market. Weakness extended through steel, blast furnace, cast iron and railroad scrap. Exact pricing is difficult owing to lack of volume.

Cincinnati December looks like it is going to be a tough month for scrap brokers and dealers. There is no local buying and extremely limited buying from outside Cincinnati. The nearest important market shows the open-hearth grades off $2 and $3.

(Please Turn to Page 266)

Cross-Bay Transfer

Automatic motor-driven transfer cars provide a universal handling system in modern parallel bay plants now served by overhead cranes. Also for transfer between plant buildings.



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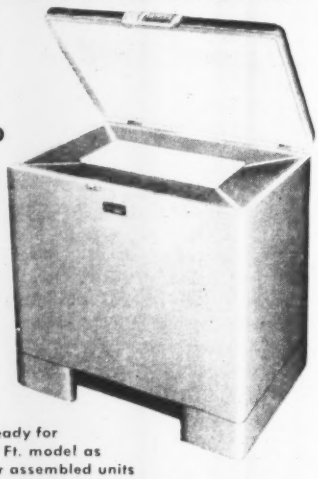

Completely equipped ready for operation. The 1.5 Cu. Ft. model as shown handles parts or assembled units up to 23" long, 12½" deep x 9" high and the 6.5 Cu. Ft. model up to 47" lengths, 16" deep x 15" high. Revco Sub-Zero Chests meet highest performance standard, featuring temperatures of 95 and 85 below zero while running continuously in normal room temperatures. Other controlled low-temperatures readily attained.

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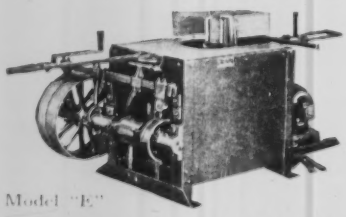

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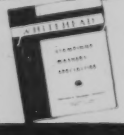

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CURRENT FERROALLOY QUOTATIONS

Prices as reported to STEEL

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton $86, Palmerton, Pa.; $87 Clairton and Duquesne, Pa.
(16 to 19% Mn) $84 per ton, Palmerton, Pa.; $85 per ton, Clairton and Duquesne, Pa.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.). Base price per net ton $200, Clairton, Duquesne, Johnstown and Sheridan, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; and Portland, Oreg.; add or subtract $2.00 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.
(Mn 79-81%) Lump $208 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 27.95c per lb of contained Mn, carload packed 28.7c, ton lots 29.8c, less ton 31.0c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85, C 1.5% max.) Carload, lump, bulk 21.35c per lb of contained Mn, carload packed 22.1c, ton lot 23.2c, less ton 24.4c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2% max): Carload, lump, bulk, 36.2c per lb of metal; packed, 36.95c; ton lot 38.45c; less ton lots 40.45c. Delivered. Spot, add 2c.

Electromanganese: Carload, 31.5c; ton lots 33.5c; 250 to 1999 lb, 35.5c. Premium for hydrogen-removed metal, 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 11.4c per lb of alloy, carload packed 12.15c, ton lots 13.05c, less ton 14.05c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton; f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 24.7c per lb of contained Cr; c.l. packed 25.65c, ton lot 26.80c, less ton 28.20c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max. 0.025% C (Simplex) 34.50c per lb contained Cr, 0.03% C 36.50c, 0.04% C 35.50c, 0.06% C 34.50c, 0.10% C 34.00c, 0.15% C 33.75c, 0.20% C 33.50c, 0.50% C 33.25c, 1% C 33.00c, 1.50% C 32.85c, 2% C 32.75c. Carload packed add 1.1c, ton lot 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 26.25c per lb contained Cr. Packed, c.l. 27.15c, ton 28.50c, less ton 30.25c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, 8 M x D, 18.35c per lb of alloy, ton lot 19.2c, less ton lot, 20.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-45%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 25.5c per lb of contained chromium plus 12.4c per pound of contained silicon. 1" x down, bulk 25.50c per pound of contained chromium plus 12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 26-29%, Al 7-9%, C 0.05% max). 25.75c per lb of contained chrome plus 12.4c per lb of contained silicon plus aluminum 3" x down delivered.

Chromium Metal: (Min 97% Cr and 1% Fe; contract, 1" x D, packed, max 0.50% carload $1.12, ton lots $1.14, less ton $1.16. Delivered. Spot, add 5c. Prices on 0.10 per cent carbon grade, add 4c to above prices.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max, C 3-3.5% max). Contract, any quantity, $3.00 per lb of contained V. Delivered. Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max, C 0.5-1% max): $3.10. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max, C 0.20% max) $3.20.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c; freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump bulk, 20.0c per lb of contained Si, packed 21.10c, ton lot 22.50c, f.o.b. Niagara Falls, freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump bulk, 12.40¢ per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.0c per lb of contained Si, carload packed 18.2c, ton lot 19.15c, less ton 20.2c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 97% Si and 1% max Fe) c.l. lump, bulk, regular 18.5c per lb of Si, c.l. packed 19.7c, ton lot 20.6c, less ton 21.6c. Add 0.3c for max. 0.10% calcium grade. Deduct 0.5c for max 2% Fe grade analyzing min 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 20 to 1999 lb 11.65c, smaller lots 12.15c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-43%, C 0.20% max). Contract, c.l. lump, bulk, 8.0c per lb of alloy, c.l. packed 8.75c, ton lot 9.5c, less ton 10.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb, smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y. freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 52-56%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c Delivered. Spot, add 0.25c.

Calcium Silicon: (Ca 30-34%, Si 60-65%, Fe 1.50% max). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 16.25c per lb of briquet, carload packed 16.95c, ton 17.75c, less ton 18.6c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.0c, less ton 14.9c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packaged 13.45c ton lot 14.2c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet. Packed c.l. 7.75c, ton lot 8.85c, less ton 9.45c Delivered. Spot, add 0.25c.
(Small size. Weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c. Packed c.l. 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquetts: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%). 10,000 lb W or more $1.10 per lb of contained W, 2000 lb W to 10,000 lb W, $1.20; less than 2000 lb W, $1.32, f.o.b. Niagara Falls, N. Y.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.10 per lb of contained Cb, less ton $6.45. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min, C 0.30% max) ton lots, 2" x D, $4.75 per lb of contained Cb plus Ta, deld.; less ton lots $4.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 4.5c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 17.50c per lb of alloy, ton lots 18.50c, less ton lots 20c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c. Packed c.l. 15.50c, ton lots, 15.75c, less ton lots, 16.25c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base; carloads f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, f.o.b. Langeloth, $1.32 in all sizes except powdered which is $1.41, Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic Oxide: Per lb, contained Mo, f.o.b. Langeloth, Pa., $1.14 in cans; in bags, $1.13, f.o.b. Langeloth, Pa.; Washington, Pa., 1.13.

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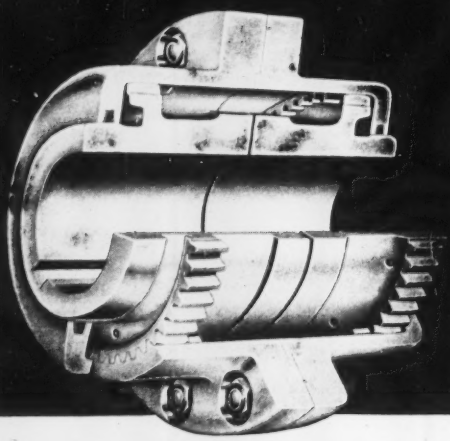

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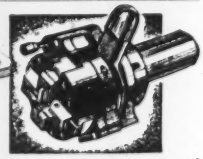

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Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

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MARKET PRICES

ORES–COKE–REFRACTORIES

Prices as reported to STEEL; changes shown in italics.

ORES

Lake Superior Iron Ore

(Prices effective July 1, 1953, and thereafter, gross ton, at ore docks, from natural rail of vessel, lower lake ports.)

Old range bessemer	$10.30
Old range nonbessemer	10.15
Mesabi bessemer	10.05
Mesabi nonbessemer	9.90
Open-hearth lump	11.15
High phosphorus	9.90

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon which were in effect on June 24, 1953, and increases or decreases after such date are for buyer's account.

Eastern Local Iron Ore

Cents per unit deld. E. Pa.

Foundry and basic 56-62% concentrates, contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	22.00
North African hematite (spot)	24.00-26.00
Brazilian iron ore, 68-69% (spot)	25.00-26.00

Tungsten Ore

Net ton unit, before duty

Foreign Wolframite, min. 65%, WO_3, good commercial quality	$39-$40
Domestic scheelite, mine	63.00

Manganese Ore

Mn, 48% nearby, $1.18-$1.21 per long ton unit, c.i.f. U. S. ports, duty for buyers' account; shipments against old contracts for 48% ore are being received from some sources at 90-92c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.:

Indian and African

48% 2.8:1	$40.00-$42.00
48% 3:1	44.00-46.00
48% no ratio	32.00-34.00

South African Transvaal

44% no ratio	$27.00-$28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	nom. $32

Domestic

(Rail nearest seller)

48% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb. Mb content, mines, unpacked	$1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

50-60%	$2.40-$2.80
65% min.	$3.40-$3.50

Vanadium Ore

Cents per lb. V_2O_5 content, deld. mills

Domestic	31.00

REFRACTORIES

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89; Ashland, Grafton, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $109; Salina, Pa., $114; Niles, O., $120; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $115; Warren, O., Hays, Pa., $120; Niles, O., $123; E. Chicago, Ind., Joliet, Rockdale, Ill., $125; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F.: Massillon, O., $178.50; Clearfield, Pa., $213; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $206; Vandalia, Mo., $214.10; Portsmouth, O., $207.50; Bessemer, Ala., $212.80.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $77.50; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Peria, Ark., $109; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $139.70; Johnstown, Pa., $140; Clearfield, Pa., $148.50; St. Louis, $151.80; Athens, Tex., $155.

Nozzles

Reesdale, Pa., $223.50; Johnstown, Pa., $229.20; Clearfield, Pa., $241.40; St. Louis, $247.10; Athens, Tex., $247.70.

Runners

Reesdale, Pa., $171; Johnstown, Pa., $177.80; Clearfield, Pa., $185.50; St. Louis, $187.30; Athens, Tex., $191.80.

High-Alumina Brick

50 Per Cent: Clearfield, Pa., St. Louis, Mexico, Mo., $179; Danville, Ill., $169.20.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $223.00; Danville, Ill., $214.20.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $225; Danville, Ill., $258; Clearfield, Pa., $232.

Dolomite

Domestic, dead-burned bulk: Bilmeyer, Pine Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bellsville, Millersville, Martin, Nario, Gibsonburg, Woodville, O., $14.50; Thornton, McCook, Ill., $14.60; Dolly Siding, Boone Terre, Mo., $13.65.

Magnesite

Domestic, deadburned bulk, Luning, Nev., $38.

METALLURGICAL COKE

Price per net ton

Beehive Ovens

Connellsville, furnace	$14.50-15.00
Connellsville, foundry	16.50-17.00

Oven Foundry Coke

Kearney, N. J., ovens	$24.00
Everett, Mass., ovens	
New England, deld.	*26.00
Chicago, ovens	24.50
Chicago, deld.	26.00
Terre Haute, ovens	24.05
Milwaukee, ovens	25.25
Indianapolis, ovens	24.25
Chicago, deld.	28.12
Cincinnati, deld.	25.85
Painesville, O., ovens	25.50
Cleveland, deld.	27.43
Erie, Pa., ovens	25.00
Birmingham, ovens	22.65
Cincinnati, deld.	27.58
Lone Star, Tex., ovens	18.50
Philadelphia, ovens	23.95
Sewickley, Pa., ovens	23.85
St. Louis, ovens	
St. Louis, deld.	26.00
St. Paul, ovens	23.75
Portsmouth, O., ovens	24.00
Cincinnati, deld.	26.62
Detroit, ovens	25.50
Detroit, deld.	26.50
Buffalo, deld.	28.08
Flint, deld.	28.23
Pontiac, deld.	27.66
Saginaw, deld.	28.58

*Or within $4.55 freight zone from works.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	40.00
Toluol, one deg.	30.00-33.00
Industrial xylol	30.00-33.50

Per ton, bulk, ovens

Sulphate of ammonia	$44-45
Birmingham area	$49.50

Cents per pound, producing point

Phenol, 40 deg. (U.S.P.), tank cars	18.00
c.l. drums	19.00
l.c.l. drums	19.50

FLUORSPAR

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $44; 70%, $42.50; 60%, $38. Imported, net ton, duty paid, metallurgical grade, $35-$36.

ELECTRODES

(Threaded with nipple, unboxed, f.o.b. plant)

GRAPHITE

Inches	Length	Per 100 lb
Diam.		
2	24	$43.50
2½	30	28.00
3	40	27.25
4	40	26.00
5	40	25.75
6	60	23.25
7, 8, 9, 10	60	21.00
12, 14	72	20.50
16	72	20.00
17	60	20.50
18	72	20.50
20	72	20.00

CARBON

40	100	$8.95
40, 35, 30	110	8.95
30	84	9.10
24	96	8.90
24	72, 84	9.10
20	90	8.95
20	84	9.10
17	72	9.10
17	60	9.50
14	72	9.50
14, 12, 10	60	10.30
8	60	10.55

QUANTITY PRODUCTION OF GREY IRON CASTINGS

ONE OF THE NATION'S LARGEST AND MOST MODERN PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY

CHATTANOOGA 2, TENN.

Price Complete
$1985
Delivery from Stock

ALFING HEAVY-DUTY DRILL PRESSES

Quick changeover from job-to-job on short or long run heavy-duty production is assured by easily adjustable head and table.

Crank raises or lowers table, head stock moves 6" up or down by hand on scraped ways. Easy-to-reach controls cut handling time. No 9" quill-supported spindle stroke, driven by 3½ h.p. V-belt motor. Motor speed 900 rpm. Drilling capacity of 1" in steel, 1¼" in cast iron. 8 spindle speeds from 150 to 1640 rpm. Drilling feed by hand or power. Table surface 26"x28". Scraped base plate may be used as table for extremely bulky work pieces. Distance between spindle and table, 23" max.; spindle and base plate, 25"-40". Write for descriptive literature.

Engineered servicing and stock parts within 48 hours from Orban Service Centers in Newark, Detroit, Cleveland.

KURT ORBAN COMPANY, INC.
205 East 42nd Street, New York 17
Branch offices and distributors from coast-to-coast

Scrap . . .

(Concluded from Page 261)

a ton. Borings and turnings fell $1 nominally.

Detroit Following closing of the automotive lists, which dropped approximately $4 on most grades, the free market in Detroit has become extremely weak. One observer says it is weaker than at any time during the past 12 months.

None of the mills in this area is purchasing more than token tonnages and there is a strong probability present conditions will continue until end of the year.

St. Louis Scrap market showed definite weakening signs at month-end with $2 markdowns predicted in No. 1 and 2 melting steel and bundles when December orders are placed. Recent good weather has improved yard stocks of dealers, who are trying hard to clean them out before the drop and ahead of cancellation of unfilled orders. Brokers believe oversupply plus a fall-off in mill business may carry the price decline well into first quarter.

Chicago Purchase of its December scrap requirements by a leading steelmaker here held prices at the existing level, the same as the November acquisition. Major open hearth and electric furnace grades were involved but total tonnage was light.

Scrap consumption in the district is shrinking somewhat as the ingot rate drops. Some inventory increase is occurring.

Turnings and borings are off about $2 a ton and there is some easing in railroad material. Yard dealers are finding business slow and have dropped prices of some grades from $1 to $4 a ton.

Birmingham Scrap remains inactive in this district with a generally weak tone in most instances. Local sources are buying little melting steel and cast grades, while mostly scarce, are moving slowly.

Los Angeles With more surplus scrap in this district than at any time for 10 years past and with demand from mills at low-ebb, movement of scrap is slow.

The Japanese steel mill cartel has set scrap buying prices at $27 to $28. West Coast dealers are refusing to export at these prices. Only one shipment of 14,000 tons has so far been made.

San Francisco The steel scrap market is depressed. Dealers wonder how long present prices will hold in view of slack demand. Mills are well stocked and with operations only around 40 per cent in this immediate area the early prospect for restocking seems dismal. Pacific States Steel Corp. remains out of the market due to a strike.

Seattle Scrap prices are unchanged but weak spots may develop when larger buyers come into the market for December requirements. One buyer reports a purchase of turnings last week at $12. Export markets have not been as active as anticipated. Some interests are offering material locally which had been held for foreign buyers.

Some scrap has been shipped from California to Japan, but except for small lots via Canadian ports, no tonnage has moved for export from here.

Canada . . .

Toronto, Ont. Production of pig iron in Canada during September amounted to 243,963 net tons, comparing with 267,219 tons in August and 222,686 in September, 1952. In the first 9 months of the year output totaled 2,271,754 net tons against 2,003,379 in the like period of last year.

Iron Ore . . .

Iron Ore Prices, Page 265

Cleveland The 1953 lake shipping season is just about over. Practically all the ore carriers are in port for the season.

Total season movement of iron ore from the upper lakes is estimated at 95,811,472 gross tons for a new record. This includes a relatively small tonnage enroute last week. Previous season record was set in 1942 when 92 million tons were brought down the lakes.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 245

Pittsburgh Sales volume for fastener producers has slipped about 10 per cent since last summer. Automakers, railroads and mill supply houses have trimmed their requirements. Delivery time has shortened for most items to within 60 days.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 265

Chicago Consumption of coke is off sharply reflecting the current low melting rate of gray iron foundries. Consumers inventories are fully adequate.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5400 tons, Uris Bros. office building, 300 Park Ave., New York, to Harris Structural Steel Co., that city.

1640 tons, warehouse, Penn Fruit Co., Philadelphia, to Bethlehem Fabricators, Bethlehem, Pa., through Barclay White Co., general contractor, Philadelphia; 100 tons of reinforcing bars went to American Steel Engineering Co., Philadelphia.

500 tons, 30-inch cold strip mill, Alan Wood Steel Co., Conshohocken, Pa., to Frank M. Weaver Co., Lansdale, Pa.

400 tons, state bridge, Lancaster-Chester counties, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

330 tons, section state cross-Bronx expressway, Bronx county, New York, to Harris Structural Steel Co., New York.

275 tons, elementary and junior high school, West Hartford, Conn., to City Iron Works, Hartford. A. E. Stephens Co., Springfield, Mass., general contractor.

225 tons, regional district high school, Sturbridge, Mass., to United Structural Steel Co., Worcester, Mass.; Neri Construction Co., Millbury, Mass., general contractor.

STRUCTURAL STEEL PENDING

3000 tons, 20-story office building, to be erected by Uris Bros., New York, at Market and Fifteenth streets, as first unit of the Penn Center Development, Philadelphia; structural bids submitted last week; 100 tons of reinforcing bars were placed through Buckley & Co., subcontractor, to Concrete Steel Co., Philadelphia.

1900 tons, section (H.T.54-9), state thruway, Rockland county, New York, bids Dec. 18.

500 tons, building, Navy yard, Philadelphia, bids Dec. 21.

150 tons, section (F.A.S.W.C. 53-2), state thruway, Westchester county, New York, bids Dec. 18.

300 tons, estimated, plant and office building, American Meter Co., Philadelphia, bids Dec. 14.

200 tons, senior high school, Nazareth, Pa., bids Dec. 17.

150 tons, Pellepart hospital, Wilmington, Del., bids Dec. 17.

100 tons, Washington state bridge, Benton county, bids to Olympia, Wash., Dec. 15.

REINFORCING BARS . . .

REINFORCING BARS PLACED

450 tons, LaSalle St. parking garage for city of Chicago, to Truscon Steel Co., Chicago; A. L. Jackson Co., contractor.

175 tons, elementary and junior high school, West Hartford, Conn., to Bethlehem Steel Co., Bethlehem, Pa.; A. E. Stephens Co., Springfield, Mass., general contractor.

100 tons, warehouse, Penn Fruit Co., Philadelphia, through Barclay White Co., that city, to American Steel Engineering Co., Philadelphia; 1500 tons of shapes went to Bethlehem Fabricators, Bethlehem, Pa.

100 tons, Penn Center Bldg., Market and Fifteenth streets, Philadelphia, through Buckley & Co., to Concrete Steel Co., that city; 3000 tons of shapes pending.

REINFORCING BARS PENDING

1200 tons, First Ave. south, Seattle, bascule bridge substructure, general award to General Construction Co., Seattle, $1,387,655 by State Highway Department.

750 tons, Wacker Drive, parking garage for city of Chicago, Herlihy Mid-Continent Co., Chicago, low on general contract.

300 tons, three state highway bridges, Billerica-Chelmsford, Mass., bids in; also 245 tons fabricated structural steel.

175 tons, extension, water district, Metropolitan District Commission, Boston; also 1500 tons structural steel support, 475 tons steel plate pipe and 375 tons cast iron pipe.

150 tons, state highway work, Snohomish and Benton counties, Washington; bids to Olympia, Wash., Dec. 15.

104 tons, two state bridges, Willington-Tolland

(Please Turn to Page 270)

The world's best . . . one-piece, drop forged—not welded—of mild carbon steel, heat-treated with head accurately milled for standard tables on lathes, planers, boring mills, milling machines. Integral washer and nut. Sizes: up to 30". Typical direct prices for 10" lengths: ½—$1.36; ⅝—$1.36; ¾—$1.58; ⅞—$1.89. Write for price list.

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MILFORD 3, NEW HAMPSHIRE

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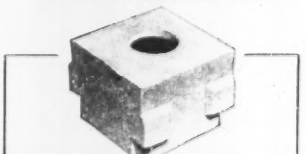
Works: Mt. Braddock, Fayette Co., Pa.
Dunbar, Pa. 4213
COVERED HOT TOP BRICK
INGOT MOLD PLUGS



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Most Complete Stock in America of
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PICKLING ACID INHIBITORS
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Use "RODINE" for improved pickling and increased production!
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AMERICAN CHEMICAL PAINT CO.
AMBLER, PA.

IRON AND STEEL SCRAP

Consumer prices, per gross ton, except as otherwise noted, including broker's commissions, as reported to STEEL. Changes shown in italics.

STEELMAKING SCRAP COMPOSITE

Dec. 3	$34.33
Nov. 25	34.67
Nov. avg.	35.00
Dec. 1952	43.00
Dec. 1948	43.25

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

(Delivered consumer plants)

No. 1 heavy melting	*$41.00-43.00*
No. 2 heavy melting	*41.00-42.00*
No. 1 bundles	*42.00-43.00*
No. 2 bundles	*40.00-41.00*
No. 1 busheling	*41.00-43.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*20.00-21.00*
Short shovel turnings	*24.00-24.00*
Cast iron borings	*22.00-23.00*
Cut structurals	*38.00-39.00*
Heavy turnings	31.00-32.00
Punchings & plate scrap	*37.00-38.00*
Electric furnace bundles	*38.00-39.00*

Cast Iron Grades

No. 1 cupola	37.00-38.00
Charging box cast	37.00-38.00
Heavy breakable cast	*35.00-36.00*
Unstripped motor blocks	*30.00-31.00*
No. 1 machinery cast	*41.00-43.00*

Railroad Scrap

No. 1 RR. heavy melt.	*$9.00-40.00*
Rails, 2 ft. and under	45.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	*43.00-44.00*
Railroad specialties	*41.00-42.00*

Stainless Steel Scrap
(F.o.b. shipping point)

18-8 bundles & solids	165-170
18-8 turnings	90-95
430 bundles & solids	87-90
430 turnings	60-62

CLEVELAND

(Delivered consumer plants)

No. 1 heavy melting	*$41.00-42.00*
No. 2 heavy melting	*27.00-28.00*
No. 1 bundles	*41.00-42.00*
No. 2 bundles	*26.00-27.00*
No. 1 busheling	*41.00-42.00*
Machine shop turnings	18.00-19.00
Mixed borings, turnings	23.00-24.00
Short shovel turnings	23.00-24.00
Cast iron borings	23.00-24.00
Low phos.	33.00-34.00
Alloy free, short shovel turnings	25.00-26.00
Electric furnace bundles	32.00-33.00

Cast Iron Grades

No. 1 cupola	43.00-44.00
Charging box cast	31.00-32.00
Stove plate	38.00-39.00
Heavy breakable cast	27.00-28.00
Unstripped motor blocks	26.00-27.00
Brake shoes	35.00-36.00
Clean auto cast	45.00-46.00
No. 1 wheels	41.00-42.00
Burnt cast	32.00-33.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt	35.00-36.00
R.R. malleable	45.00-46.00
Rails, 3 ft. and under	49.00-50.00
Rails, 18 in. and under	50.00-51.00
Rails, random lengths	42.00-43.00
Cast steel	41.00-42.00
Railroad specialties	41.00-42.00
Uncut tires	39.00-40.00
Angles, splice bars	45.00-46.00
Rails, rerolling	49.00-50.00

Stainless Steel
(F.o.b. shipping point)

18-8 bundles, solids	nom. 160.00-170.00
18-8 turnings	nom. 70.00-80.00
430 clips, bundles, solids	nom. 70.00
430 turnings	nom. 50.00

YOUNGSTOWN

(Delivered consumer plants)

No. 1 heavy melting	*$41.00-42.00*
No. 2 heavy melting	*40.00-41.00*
No. 1 bundles	*43.00-44.00*
No. 2 bundles	*38.00-39.00*
Machine shop turnings	17.00-18.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Low phos.	35.00-36.00
Electric furnace bundles	35.00-36.00

Railroad Scrap

No. 1 R.R. heavy melt	36.00-37.00

PHILADELPHIA

(Delivered consumer plants)

No. 1 heavy melting	33.00
No. 2 heavy melting	32.00
No. 1 bundles	35.00
No. 2 bundles	30.00
No. 1 busheling	35.00
Electric furnace bundles	36.00-37.00
Machine shop turnings	22.00
Mixed borings, turnings	24.50
Short shovel turnings	28.00
Structurals & plate	38.50
Heavy turnings	31.00-31.50
Couplers, springs	42.00
Rail crops 2 ft. & under	48.00-50.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Charging box cast	nom.
Heavy breakable cast	30.00
Unstripped motor blocks	28.00
Drop broken machinery	42.00-43.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*24.00-25.00*
No. 2 heavy melting	*21.50-22.50*
No. 1 bundles	*24.00-25.00*
No. 2 bundles	*19.50-20.50*
Machine shop turnings	*11.00-12.00*
Mixed borings, short turnings	*15.00-16.00*
Low phos. (structural & plate)	*27.50*
Short shovel turnings	*16.00-17.00*

Cast Iron Grades

No. 1 cupola	29.00-30.00
Unstripped motor blocks	21.00-22.00

Stainless Steel

18-8 sheets, clips solids	165.00-175.00
18-8 borings, turnings	85.00-90.00
430 sheets, clips, solids	80.00-85.00
410 sheets, clips, solids	70.00-75.00

BOSTON

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	25.00-26.00
No. 2 heavy melting	*20.25-21.25*
No. 1 bundles	24.00-25.00
No. 2 bundles	*18.25-19.25*
Machine shop turnings	*12.00-13.00*
Mixed borings, turnings	*15.00-16.00*
Short shovel turnings	*16.50-17.00*
No. 1 cast	29.00-30.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-37.00

CINCINNATI

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	*24.00-25.00*
No. 2 heavy melting	*20.00-21.00*
No. 1 bundles	*24.00-25.00*
No. 2 bundles	*18.00-19.00*
No. 1 busheling	*24.00-25.00*
Machine shop turnings	*13.00-14.00*
Mixed borings, turnings	*17.00-18.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Low phos., 18 in.	*28.00-29.00*

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	35.00
Charging box cast	35.00
Drop broken machinery	46.00

Railroad Scrap

No. 1 R.R. heavy melt	34.00-35.00
Malleable	42.00-43.00
Rails, 18 in. and under	*47.00-48.00*
Rails, random lengths	39.00-40.00

CHICAGO

No. 1 heavy melting	33.00-34.00
No. 2 heavy melting	28.00-29.00
No. 1 factory bundles	34.00-35.00
No. 1 dealer bundles	*31.50-32.50*
No. 2 bundles	26.00-27.00
No. 1 busheling	33.00-34.00
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Cut structurals, 3 ft.	37.00-38.00
Punchings & plate scrap	37.00-38.00
Electric furnace bundles	36.00-37.00

Cast Iron Grades

No. 1 cupola	34.00-35.00
Stove plate	29.00-30.00
Unstripped motor blocks	19.00-20.00
Clean auto cast	38.00-40.00
Drop broken machine	38.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt	*43.00-45.00*
R.R. malleable	40.00-41.00
Rails, 2 ft. and under	*45.00-47.00*
Rails, 18 in. and under	*47.00-49.00*
Angles, splice bars	40.00-42.00
Rails, rerolling	*45.00-47.00*

Stainless Steel Scrap

18-8 clips & solids	140.00-150.00
18-8 turnings	nom. 70.00
430 clips & solids	70.00
430 turnings	nom. 30.00

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 heavy melting	*27.00*
No. 2 heavy melting	*27.00*
No. 1 bundles	*27.00*
No. 2 bundles	*27.00*
No. 1 busheling	*27.00*
Machine shop turnings	*13.00*
Mixed borings turnings	*13.00*
Short shovel turnings	*14.00*
Punchings & plate strap	*29.00*

Cast Iron Grades

No. 1 cupola	*38.00*
Charging box cast	*30.00*
Stove plate	*32.00*
Heavy breakable	*28.00*
Unstripped motor blocks	*24.00*
Clean auto cast	40.00
Malleable	40.00

BUFFALO

No. 1 heavy melting	*$2.00-$3.00*
No. 2 heavy melting	*29.00-29.50*
No. 1 bundles	*$2.00-$3.00*
No. 2 bundles	*27.00-27.50*
No. 1 busheling	*$2.00-$3.00*
Machine shop turnings	*19.50-20.50*
Mixed borings, turnings	*21.50-22.00*
Short shovel turnings	*22.50-23.00*
Cast iron borings	*21.50-22.00*
Low phos.	*36.00-37.00*

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	34.00-35.00
No. 1 machinery	39.00-40.00

Railroad Scrap

Rails, random lengths	*$9.00-40.00*
Rails, 2 ft. and under	*44.00-45.00*
Railroad specialties	*42.00-43.00*

BIRMINGHAM

No. 1 heavy melting	26.00-26.50
No. 2 heavy melting	24.00-24.50
No. 1 bundles	26.00-26.50
No. 2 bundles	22.00-22.50
Machine shop turnings	19.50-20.00
Short shovel turnings	20.50-21.00
Cast iron borings	20.50-21.00
Cut structurals	nom.
Electric furnace bundles	nom.

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	41.00-42.00
Charging box cast	30.00-31.00
Stove plate	38.00-39.00
Bar crops and plate	38.00-39.00
Cut structurals	36.00-37.00
Heavy breakable cast	30.00-31.00
Unstripped motor blocks	34.00-35.00
No. 1 wheels	46.00-47.00

Railroad Scrap

No. 1 R.R. heavy melt	nom.
Rails, 3 ft. and under	42.00-43.00
Rails, random lengths	39.00-40.00
Angles, splice bars	38.00-39.00
Rails, rerolling	46.00-47.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	*28.00-29.00*
No. 1 bundles	33.00
No. 2 bundles	27.00-28.00
Machine shop turnings	14.00-15.00
Short shovel turnings	*14.00-15.00*

Cast Iron Grades

No. 1 cupola	38.00-39.00
Charging box cast	29.00-30.00
Heavy breakable cast	31.00-32.00
Unstripped motor blocks	*28.00-29.00*
Brake shoes	*35.00-36.00*
Clean auto cast	39.00-40.00
Burnt cast	31.00-32.00

Railroad Scrap

Malleable	37.00-38.00
Rails, 18 in. and under	*46.00-47.00*
Rails, random lengths	*39.00-40.00*
Rails, rerolling	*41.00-42.00*
Uncut tires	33.00-34.00
Angles, splice bars	*36.00-37.00*

SEATTLE

(Delivered consumer plants)

No. 1 heavy melting	31.00
No. 2 heavy melting	27.00
No. 1 bundles	24.00
No. 2 bundles	19.00
No. 3 bundles	15.00
Machine shop turnings	12.00-12.50
Mixed borings, turnings	12.00-12.50
Short shovel turnings	12.00-12.50
Electric furnace, No. 1	36.00-38.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	30.00-35.00
Heavy breakable cast	25.00-30.00
Unstripped motor blocks	27.00
No. 1 wheels	38.00-40.00
Stove plate	29.00

Railroad Scrap
(Delivered consumer plants)

Rails, random lengths	30.00-34.00

SAN FRANCISCO

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
No. 1 busheling	24.00
Machine shop turnings	7.00
Mixed borings, turnings	7.00
Short shovel turnings	11.00
Cast iron borings	11.00
Cut structurals	28.00
Heavy turnings	11.00
Punchings & plate scrap	28.00
Electric furnace bundles	22.00

Cast Iron Grades

No. 1 cupola	39.00
Charging box cast	35.00
Stove plate	37.00
Heavy breakable cast	36.00
Unstripped motor blocks	29.00
Brake shoes	35.00
Clean auto cast	39.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	43.00

LOS ANGELES

No. 1 heavy melting	23.00
No. 2 heavy melting	19.00
No. 1 bundles	22.00
No. 2 bundles	19.00
Machine shop turnings	7.00

Cast Iron Grades
(F.o.b. shipping point)

No. 1 cupola	40.00-41.00

HAMILTON, ONT.

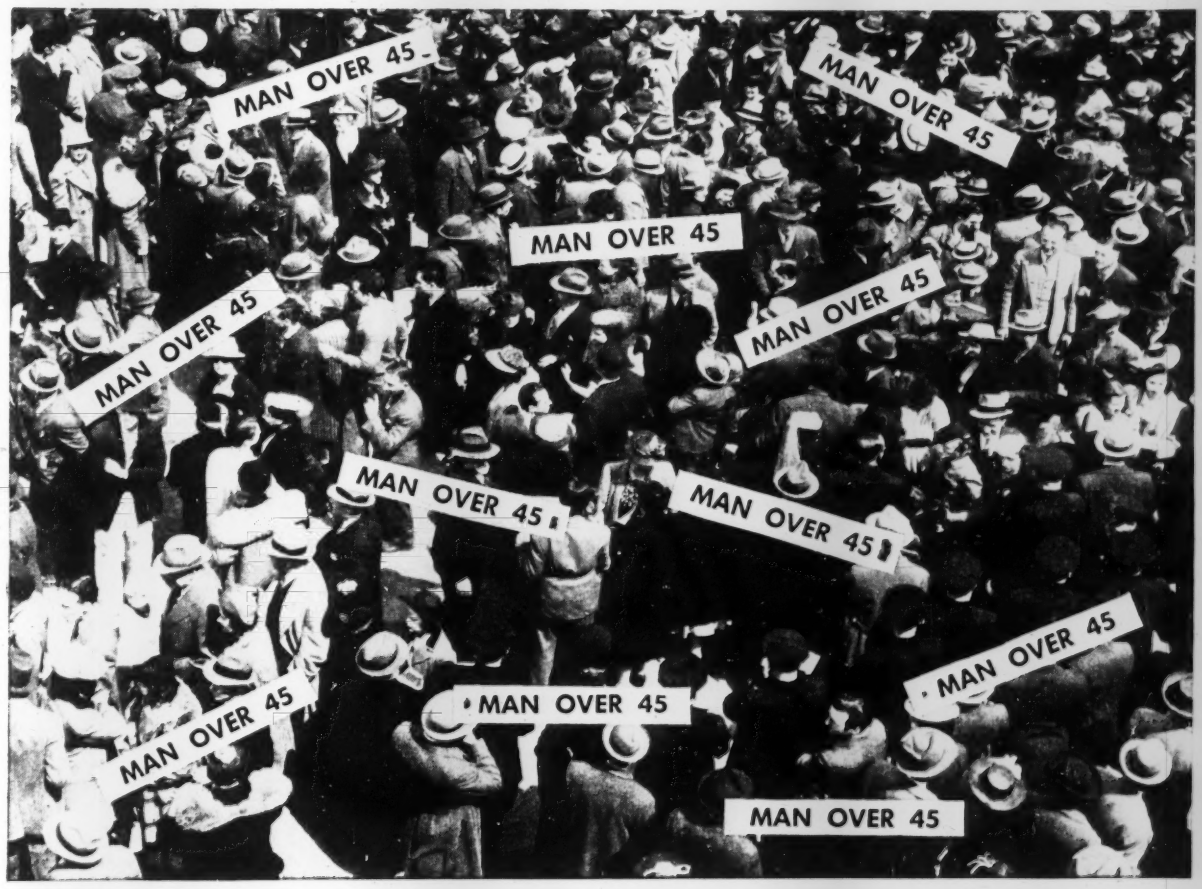
(Delivered prices)

Heavy melting	$32.50
No. 1 bundles	32.50
No. 2 bundles	*$2.00*
Mechanical bundles	*$0.50*
Mixed steel scrap	28.50
Mixed borings, turnings	*20.00*
Remelting	32.50
Rails, rerolling	41.50
Busheling	26.50
Busheling new factory	
Prepd.	30.50
Unprepd.	28.50
Short steel turnings	*20.00*

Cast Iron Grades

No. 1 machinery cast	46.00

F.o.b. shipping point.



But why MEN over 45?

Our doctors still don't know *why*, but if you are a man over 45 you are six times as likely to develop lung cancer as a man of your age twenty years ago. They *do* know, however, that their chances of saving your life could be about *ten times* greater if they could only detect cancer long before you notice any symptom in yourself. (Only 1 in every 20 lung cancers is being cured today, largely because most cases progress too far before detected.) That's why we urge that you make a habit of having your chest X-rayed every six months, no matter how well you may *feel*. The alarming increase of lung cancer in men over 45 more than justifies such precautions. Far too many men die needlessly!

Our new film "The Warning Shadow" will tell you what every man should know about lung cancer. To see this film and to get life-saving facts about other forms of cancer, phone the American Cancer Society office nearest you or simply write to "Cancer"—in care of your local Post Office.

American Cancer Society

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Ellington, Conn., bids Dec. 7, Hartford, Conn.

100 tons, Washington state highway projects; bids in Dec. 1.

100 tons or less, including shapes, Montana state bridges, Bingham county; bids to Helena, Mont., Dec. 5.

PLATES . . .

PLATES PLACED

2400 tons, fifty oil storage tanks, subaward for Haines-Fairbanks, Alaska, pipeline, to Chicago Bridge & Iron Co., Seattle.

100 tons or more, accumulator for Scott Paper Co.'s plant addition, Everett, Wash., to Chicago Bridge & Iron Co., Seattle.

PIPE . . .

CAST IRON PIPE PENDING

250 tons, 14,500 feet of 12 to 48-in. water pipe, or alternatives; bids to Mary J. Winchester, clerk, Port Townsend, Wash., Dec. 15.

RAILS, CARS . . .

LOCOMOTIVES PLACED

State Railways Administration of Uruguay, 38 diesel-electric units to General Electric Co., Schenectady, N. Y., list comprised twenty-seven 1000-hp, seven 600-hp and four 150-hp units.

RAILROAD CARS PLACED

Canadian National, 60 baggage and freight cars, with the National Steel Car Corp., Hamilton, Ont., receiving an order to build 30 baggage cars and the Eastern Car Co., Sydney, N. S., an order to build 15 thirty-ton steel stock cars and 15 fifty-ton air dump cars.

CLASSIFIED

Positions Wanted

INDUSTRIAL SALESMAN. Pittsburgh District. 39. Twelve years sales experience. Wide acquaintance Tri-State District industries, mills, mines and industrial distributors. Engineering background. Desires opportunity $5,000-$10,000. Reply Box 867, STEEL, Penton Building, Cleveland 13, Ohio.

PLANT OR PRODUCTION MANAGER. Experience covers all phases of plant operation and control, including, costs, methods improvement, incentives and labor relations. M.I.T. graduate. Reply Box 868, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES ENGINEER: REGISTERED PROFESSIONAL FIFTEEN YEARS ADMINISTRATIVE STEEL MILL, FOUNDRY, PROCESS, OIL REFINERY EXPERIENCE DESIRES TECHNICAL SALES CAPITAL MACHINERY AND EQUIPMENT. LIFE LONG RESIDENT STEEL CENTER. REPLY P. O. BOX 801, PITTSBURGH 30, PENNSYLVANIA.

Help Wanted

PRODUCTION DEVELOPMENT ENGINEER. Qualified Mechanical Engineer in charge of Production Development Engineering for well established producer of Electric Welded Steel Tubing. Experienced, hard working, intelligent man will receive excellent opportunity and salary. Reply confidential. Write Box 869, STEEL, Penton Bldg., Cleveland 13, Ohio.

CHIEF ENGINEER

A Manufacturer of Resistance Welding Equipment, Special Machinery, Fixtures and Related Lines has a position open for an aggressive man as Chief Engineer. Applicant must have a thorough and practical knowledge of mechanical engineering and the application and design of resistance welding equipment and hydraulics. Location, Detroit, Michigan. Write Box 863, STEEL, Penton Bldg., Cleveland 13, Ohio.

For Sale

FOR SALE

Brosius floor type charging manipulator, equipped with peel, attached to Hyster Model 10 lift truck. Suitable for handling 5" billets. In excellent condition. Write Box 861, STEEL, Penton Bldg., Cleveland 13, Ohio.

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USED AS IS RECONDITIONED

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Gondolas, Composite, or All Steel 50-Ton and 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Ore Hoppers, All-Steel, 50-Ton, Heavy Duty
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled
Hoppers, All Steel, 70-ton, Triple Hopper Cross Dump

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50-Ton, Drop Door
Side Dump, 30-YD., 50-TON, DROP DOOR

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Locomotive Cranes
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ONE ALCO STANDARD GAUGE DIESEL-ELECTRIC LOCOMOTIVE

100-TON, 600 H.P., TYPE 0-4-4-0

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10,000 Gallon

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Prominent Midwest manufacturer of newly developed foundry equipment for molding and core rooms needs aggressive sales representatives for U.S.A. and Canada. Protected territories, complete advertising assistance. Representatives capable of doing an energetic selling job please reply, including references, experience and lines now handled.

Reply Box 870, STEEL
Penton Bldg. Cleveland 13, Ohio

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Excellent opportunity for energetic man in sales and servicing of super refractory products. Previous selling or plant experience desirable. Position permanent with well established concern. In replying, give complete history and reference.

Address Box 865, STEEL
Penton Bldg. Cleveland 13, Ohio

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For refractory and insulation products used by the steel industry. Unusual future opportunities and adequate salary with large established midwestern concern. Reply by letter only.

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1—#6 HILLES & JONES VERTICAL OPEN SIDE BAR SHEAR, CAPACITY 3½" ROUNDS, INCLUDING 15 HP, 230 VOLT D.C. MOTOR. EST. WT. 50,000 LBS.

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Cable Address: "Foster Pittsburgh"

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ENGEL REALTY CO.
1921 First Ave., N. Birmingham, Ala.

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PANGBORN BLAST CLEANING

cuts maintenance cost and time!

Pangborn Blast Cleaning Machine—Cleans tanks, bridges, buildings, and other structures quickly and economically. Ideal for maintenance and other jobs, such as removal of dirt, scale, rust, etc. preparatory to painting. Six sizes, stationary or portable, from . . . **$188** and up.

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Pangborn Unit Dust Collectors—Trap dust at the source. Minimize maintenance, allow reclamation of valuable material . . . **$286** and up.

Pangborn Hydro-Finish Cabinets—Remove directional grinding lines, hold tolerances to .0001". Reduce further finishing of tools, molds, dies . . . **$1410** and up.

Write for details on these machines to: PANGBORN CORPORATION, 1600 Pangborn Blvd., Hagerstown, Md.

Look to Pangborn for the latest developments in Blast Cleaning and Dust Control equipment.

Pangborn
BLAST CLEANS CHEAPER
with the right equipment for every job

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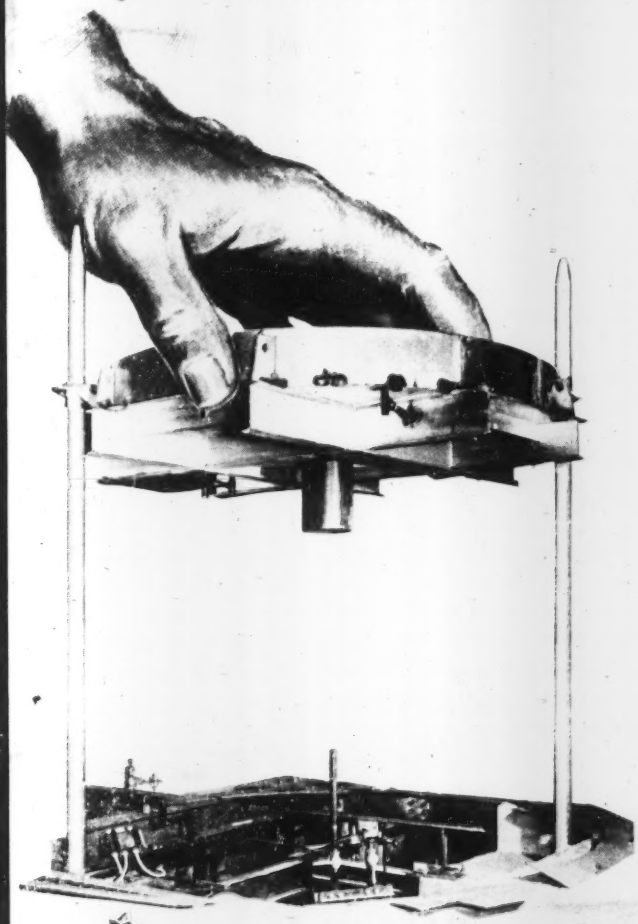
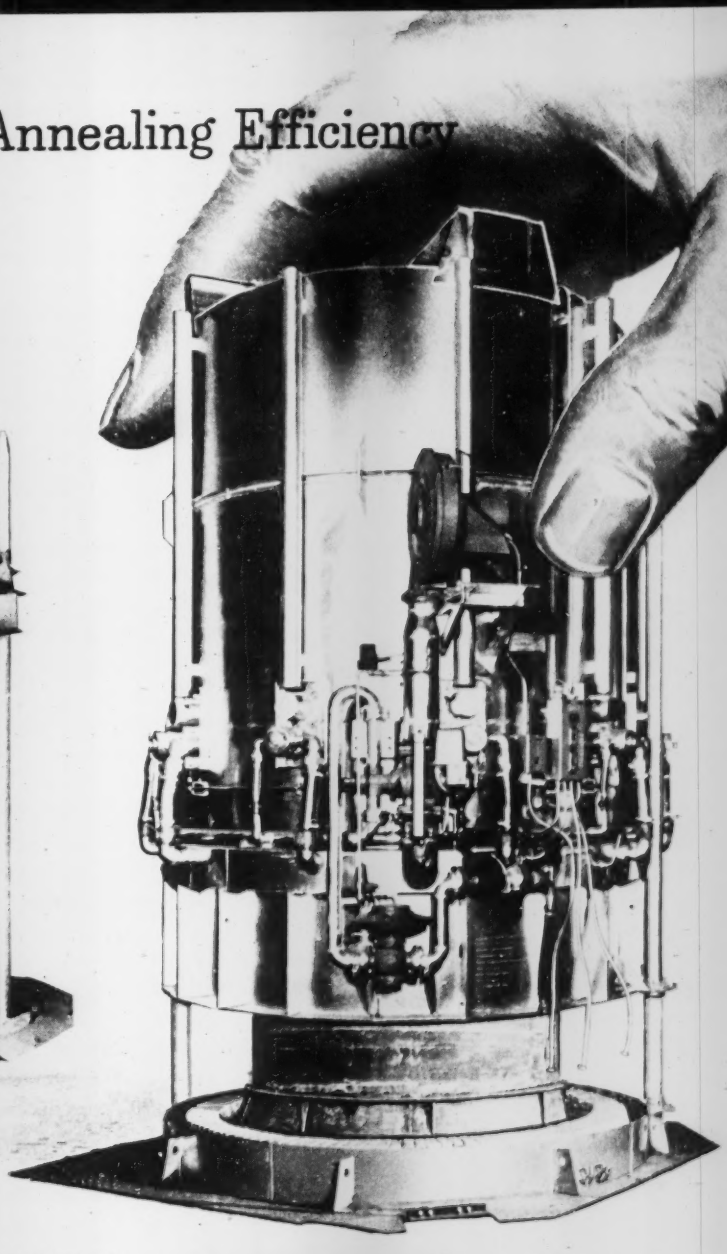
A *miracle* of Annealing Efficiency



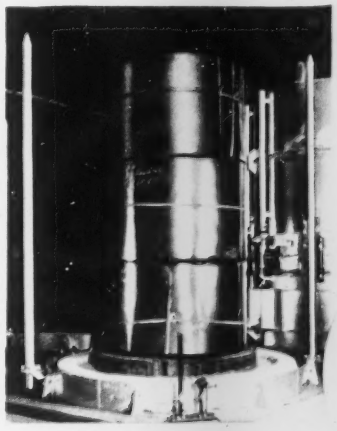


Here's the fastest, most accurate annealing system yet developed . . . with a plus feature that *eliminates down time due to repair and maintenance*. Truly a miracle of annealing efficiency. That's the Lee Wilson Single-Stack Portable Base Radiant Tube Annealing System, the latest innovation by the company that invented and developed radiant tube annealing.

A Lee Wilson engineer can prove to you that by using single-stack type furnaces you are able to double production from a given floor area, and with lighter, less expensive auxiliary equipment. The new, doubly efficient, high speed Wilson "O" tube not only steps up production speeds but permits a much greater accuracy of heat control. This means you get faster production of a better product.

And the completely portable base can, when maintenance is required, be detached in a matter of minutes, removed by light crane equipment . . . a spare base dropped in place, and production continued.

There's a lot more . . . for example, expensive basements and understructures have all but been eliminated. But why not get the full story? Write today for a copy of Lee Wilson's Single-Stack Portable Base brochure.



A typical load on a single-stack furnace base . . . 72" in diameter . . . a piling height of 156" . . . each coil weighing 20 tons.

The heart of the Lee Wilson Single-Stack Furnace is the "O" Type Radiant Tube arrangement that delivers an input of 500,000 BTU per tube, per hour.

Lee Wilson ENGINEERING COMPANY • INC.

20005 WEST LAKE ROAD • CLEVELAND, OHIO

86" flying shear cuts 1/16" to 1/2" sheets or plates at 1550 ft. per minute... *with help of TIMKEN® bearings*

THE 86" flying shear on this hot strip mill at the Kaiser Steel Corporation's Fontana Works accurately cuts 1/16" to 1/2" thick sheets or plates into 20 to 60 foot lengths. Although the strip is moving as fast as 1550 feet per minute, the shear holds consecutive sheets or plates to extremely close length limits. To insure this accuracy with minimum maintenance, United Engineering & Foundry Co. mounted the shear drum rolls and drive gears on Timken® tapered roller bearings.

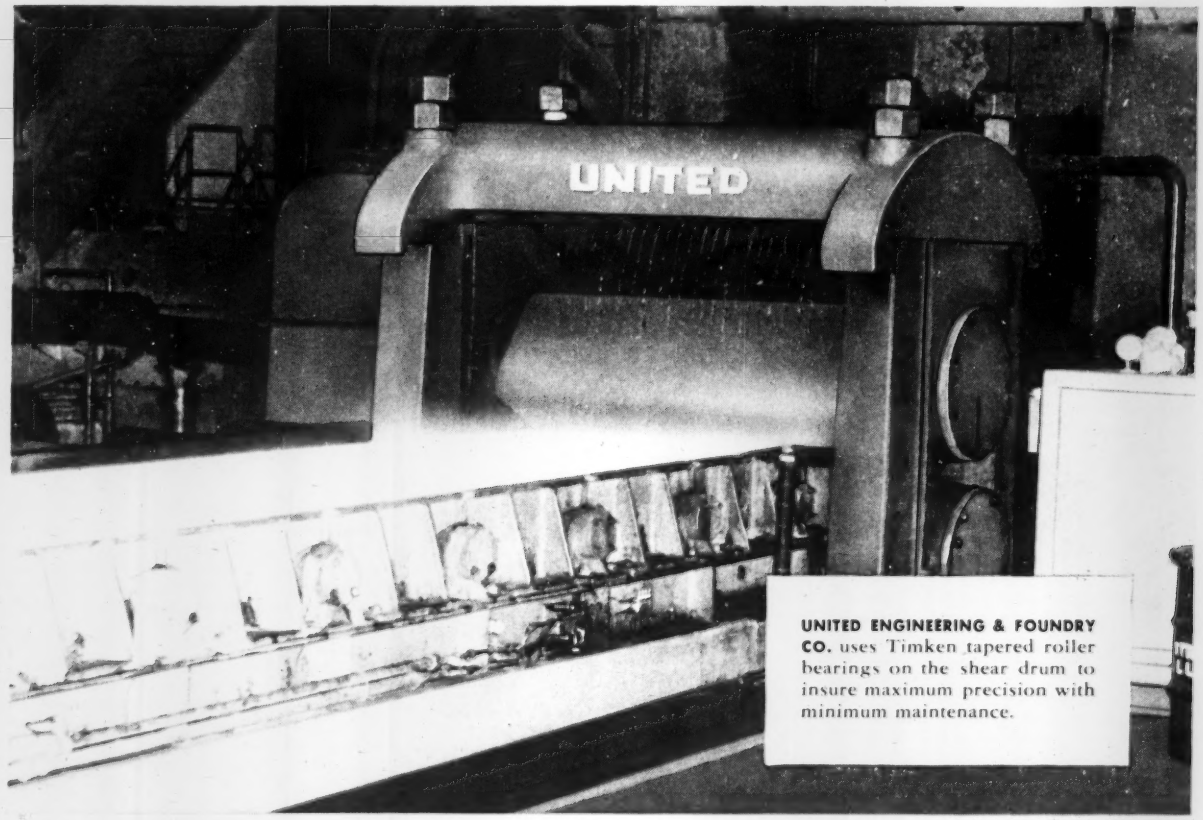
Timken bearings in the shear drum rolls take the terrific shock loads of the shearing operation. Their case-hardened rollers and races have tough, shock-resistant cores.

Specially designed gears regulate the length of cut in 1/4" steps. Timken bearings keep the gears in accurate and positive alignment. And Timken bearings' tapered construction lets them take any combination of radial and thrust loads. They take the heavy thrust of the helical gears with ease. They also locate all of the shafts in this intricate gear train.

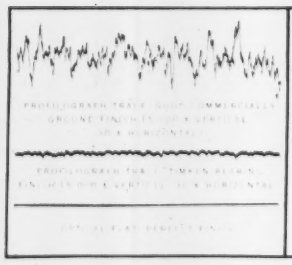
Be sure to specify Timken bearings in the machines you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

TIMKEN BEARING EQUIPPED

This symbol on a product means its bearings are the best.



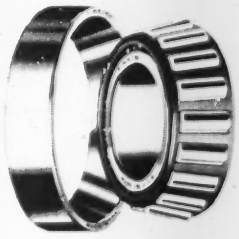
UNITED ENGINEERING & FOUNDRY CO. uses Timken tapered roller bearings on the shear drum to insure maximum precision with minimum maintenance.



SMOOTH TO MILLIONTHS OF AN INCH

Surface finish of high quality Timken bearing rollers and races is so smooth that it takes a profilograph to measure its smoothness. This instrument measures surface variations to a millionth of an inch, as shown at the left.

TAPERED ROLLER BEARINGS



NOT JUST A BALL NOT JUST A ROLLER THE TIMKEN TAPERED ROLLER BEARING TAKES RADIAL AND THRUST LOADS OR ANY COMBINATION